



Environmental Impact Assessment Report

Lairdmannoch Energy Park

Chapter 6: Ecology (Additional Information)

Lairdmannoch Energy Park Limited

wind2

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AI Technical Appendix 6-8 : National Vegetation Classification Survey (Western Access); and

AI Technical Appendix 6-9: Fish Habitat Survey and Outline Sampling Locations for Future Fish Monitoring Plan.

Glossary of Terms

Term	Definition
The Applicant	Lairdmannoch Energy Park Limited
The Agent	Atmos Consulting Limited
Environmental Advisors and Planning Consultants	Atmos Consulting Limited
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of carrying out, in a systematic way, an assessment of the likely significant environmental effects from a development
Environmental Impact Assessment Regulations	The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations)
Environmental Impact Assessment Report	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
Habitats Directive	European Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (as amended)
<i>2025 EIA Report</i>	<i>Environmental Impact Assessment Report submitted with application ECU00004900 in May 2025</i>
The Proposed Development	Lairdmannoch Energy Park
The Proposed Development Site	The full application boundary as per Figure 1-1
Study Area	For statutory designated sites up to 10 km, for non-statutory designated sites up to 3 km, for all other receptors – within the Proposed Development Site
Solar Development	The area of the Proposed Development that contains the Solar Arrays and associated infrastructure. As shown on Maps 7, 8 and 9 of Figure 3-1.
Wind Development	The area of the Proposed Development that contains the Wind Turbines and associated infrastructure. As shown on Maps 1, 2 and 4 of Figure 3-1.

List of Abbreviations

Abbreviation	Description
<i>AI</i>	<i>Additional Information</i>
ARG UK	Amphibian and Reptile Groups of the United Kingdom
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BMP	Biosecurity Management Plan
CAR	Controlled Activities Regulations
CEMP	Construction Environment Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
cm	Centimetre
DGC	Dumfries & Galloway Council
EcIA	Ecological Impact Assessment
ECU	Energy Consents Unit
EF	Electrofishing
EIA	Environmental Impact Assessment
ECOW	Ecological Clerk of works
EnvCoW	Environmental Clerk of Works

Abbreviation	Description
FCS	Forestry Commission Scotland
FHS	Fish Habitat Survey
FMP	Fish Monitoring Plan
GCN	Great Crested Newt
GFT	Galloway Fisheries Trust
GWDTE	Ground Water Dependant Terrestrial Ecosystem
ha	Hectare
HAP	Habitat Action Plan
HMP	Habitat Management Plan
IEF	Important Ecological Feature
JNCC	Joint Nature Conservation Committee
km	Kilometre
LDP	Local Development Plan
LERC	Local Environmental Record Centre
LNCS	Local Nature Conservation Site
m	Metre
mph	Miles per hour
NGR	National Grid Reference
NNR	National Nature Reserve
NPF4	National Planning Framework 4
NS	NatureScot
NVC	National Vegetation Classification
OBEMP	Outline Biodiversity Enhancement Management Plan
OHMP	Outline Habitat Management Plan
PCM	Post Construction Monitoring
PPP	Pollution Prevention Plan
PRF	Potential Roost Feature
SAC	Special Area of Conservation
SAP	Species Action Plan
SBL	Scottish Biodiversity List
SCADA	Supervisory Control and Data Acquisitions
SEPA	Scottish Environment Protection Agency
SPP	Species Protection Plan
SSPCA	Scottish Society of the Prevention of Cruelty to Animals
SSSI	Site of Special Scientific Interest
SQE	Suitably Qualified Ecologist..
SWSEIC	South West Scotland Environmental Information Centre
T	Turbine
TA	Technical Appendix
TN	Target Note
ZoI	Zone of Influence

6. Ecology

6.1 Introduction

- 6.1.1. *In May 2025, Lairdmannoch Energy Park Limited ('the Applicant') submitted a planning application (Ref. No: ECU00004900) to the Energy Consents Unit (ECU) seeking consent under Section 36 of the Electricity Act 1989 (the 'Electricity Act') and deemed planning permission under Section 57 of the Town and Country Planning (Scotland) Act 1997 (the '1997 Act') for the construction and operation of an electricity generating station known as Lairdmannoch Energy Park (the 'Proposed Development').*
- 6.1.2. *The application included an Environmental Impact Assessment Report (the '2025 EIA Report'), prepared in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the 'EIA Regulations').*
- 6.1.3. *This revised version of **Chapter 6: Ecology** (May 2025) and associated Technical Appendices (TAs) form part of the supporting documentation to the Additional Information (AI) Report.*
- 6.1.4. *The Chapter text is reproduced in full and replaces the version contained within the 2025 EIA Report. New text is shown in red italics, while text replacing the original has been identified used strikethrough formatting.*
- 6.1.5. This *revised* Chapter describes and evaluates the current nature conservation interest for the Proposed Development Site and Study Area. The Chapter evaluates both habitats and non-avian animal species and assesses the potential impacts of the Proposed Development on habitats and species above a certain value.
- 6.1.6. Potential impacts on birds are considered separately in **AI Chapter 7: Ornithology**.
- 6.1.7. This Chapter has been prepared by Atmos Consulting Ltd (Atmos) , led by Principal Ecologist Stephen McNee who is an Associate member of the Chartered Institute of Ecology and Environmental Management (CIEEM) with 15 years' experience as an ecological consultant.
- 6.1.8. The Proposed Development was subject to a pre-application enquiry, which at the time proposed 12 wind turbines, 180 m at tip height; and other associated infrastructure, with no attached solar development (Planning Application Reference: 20/04174/PREMAJ). The Proposed Development has since been reduced to ~~9~~ **8** turbines, and a solar array and BESS development included.
- 6.1.9. An Environmental Impact Assessment (EIA) Scoping Opinion request was submitted to the Energy Consents Unit in August 2023. This document detailed ecological surveys which were carried out in 2020 to inform that document, and further proposed surveys. An updated round of all required surveys was then undertaken in 2023/2024.
- 6.1.10. The results of the baseline surveys were used to inform the design of the Proposed Development and form the basis of the detailed assessment presented in this Chapter.
- 6.1.11. An outline Habitat Management Plan (HMP) has been produced as the mechanism to deliver mitigation in relation to sensitive habitats such as priority peatland and broadleaved woodland (see **TA 6-6: Outline Habitat Management Plan** in **Volume 3** of the **2025** EIA Report).
- 6.1.12. The Proposed Development Site is centred on National Grid Reference (NGR) NX 66233 62404, located approximately 7 km north-east of Gatehouse of Fleet and 10 km west of Castle Douglas in Dumfries and Galloway. The Proposed Development Site occupies an area of approximately 612.2 ha.

- 6.1.13. The Chapter is supported by the following Technical Appendices:
- Technical Appendix 6-1: Extended Phase 1 Habitat Survey;
 - Technical Appendix 6-2: National Vegetation Classification Survey;
 - Technical Appendix 6-3: Bat Surveys (automated statics);
 - Technical Appendix 6-4: Protected Mammal Surveys;
 - Technical Appendix 6-5: (Confidential) Protected Mammal Surveys; and
 - Technical Appendix 6-6: Outline Habitat Management Plan.
- 6.1.14. *This revised Chapter incorporates additional environmental information collated to supplement that presented in **Chapter 6: Ecology** of the 2025 EIA Report and addresses the updates to the Proposed Development design, namely:*
- *Removal of Turbine 8 (T8); and*
 - *Decrease in tip height of Turbine 6 (T6) and Turbine 9 (T9) from 180 m to 149.9 m*
- 6.1.15. *These design changes are hereafter collectively referred to as the 'revised Proposed Development'.*
- 6.1.16. *As a result of the revised Proposed Development and consultee comments received following submission of the 2025 EIA Report, three new TAs have been prepared:*
- *AI TA 6-7: Revised Bat Curtailment Strategy;*
 - *AI TA 6-8 : National Vegetation Classification Survey (Western Access); and*
 - *AI TA 6-9: Fish Habitat Survey and Outline Sampling Locations for Future Fish Monitoring Plan.*

6.2 Legislation, Planning Policy and Guidance

- 6.2.1. The baseline surveys and ecological assessment have been carried out with reference to the legislation, policy and guidance outlined below.

Legislation

- 6.2.2. The non-avian ecology assessment has been undertaken with reference to the following legislation:
- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora;
 - The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
 - Wildlife and Countryside Act 1981 (as amended);
 - Wildlife and Natural Environment (Scotland) Act 2011 (as amended);
 - Nature Conservation (Scotland) Act 2004 (as amended);
 - Protection of Badgers Act 1992; and
 - Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

Planning Policy

National Policy

- 6.2.3. Relevant planning policy is summarised in **Chapter 4: Planning Policy and Legislation** in **Volume 2** of the **2025** EIA Report. This section focuses solely on policy which is relevant to non-avian ecology.

- 6.2.4. Policy 3 'Biodiversity' and Policy 4 'Natural Places' of the National Planning Framework 4 NPF4 is considered relevant to this assessment. In particular where it states at Policy 3(b):

"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, including nature networks so they are in a demonstrably better state than without intervention. This will include future management. To inform this, best practice assessment methods should be used. (Scottish Government, 2023)."

Local Planning Policy

- 6.2.5. The relevant provisions of the Dumfries and Galloway Local Development Plan (LDP) are important material considerations in relation to the Proposed Development. The LDP and supplementary guidance applicable to the Proposed Development currently consists of:
- Dumfries and Galloway Council Local Development Plan 2 (DGC LDP2) (October 2019);
 - Supplementary guidance: Wind Energy Development: Development Management Considerations (February 2020); and
 - Supplementary guidance: Part 1 Wind Energy Development: Development Management Considerations Appendix 'C' DGWFLCS (February 2020).

Other Guidance

- 6.2.6. The Scottish Biodiversity List (SBL) (Scottish Government (2025)) is a list of animals, plants, and habitats that the Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland.
- 6.2.7. Both scientific and social criteria have been used to define the SBL. Scientific criteria include all Priority Species and Priority Habitats included in the now superseded UK Biodiversity Action Plan (BAP) (UK Biodiversity Partnership, 2007 *et seq.*), which occur in Scotland.
- 6.2.8. Social criteria are based on the results of an omnibus survey of the Scottish public carried out in 2006 and includes some common species and habitats. This chapter only considers those listed using scientific criteria.
- 6.2.9. Additional key guidance documents relating to the assessment of effects of wind farms on non-avian ecological receptors that have been referenced in this assessment include the following:
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (CIEEM, 2024);
 - Advising on peatland, carbon-rich soils and priority peatland habitats in development management (NatureScot, 2025);
 - Bats and onshore wind turbines: survey, assessment and mitigation (Scottish Natural Heritage (now called NatureScot), Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd., the University of Exeter, and the Bat Conservation Trust (BCT), updated 2021);
 - NatureScot pre-application guidance for solar farms (NatureScot, 2025);
 - Scottish Environment Protection Agency (SEPA) Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems (SEPA, 2024); and
 - Good Practice During Windfarm Construction (Scottish Renewables, Scottish Natural Heritage, SEPA and Forestry Commission Scotland (FCS), 2010).

Consultation

- 6.2.10. The assessment process has been informed by the Pre-Application response received from the Dumfries and Galloway Council (20/1837/HLE) and the EIA Scoping Opinion (Ref. ECU00004900). Responses to these comments are included in Table 6-1.
- 6.2.11. The application included an Environmental Impact Assessment Report (**2025** EIA Report), prepared in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the 'EIA Regulations').
- 6.2.12. A summary of the key consultation responses relevant to non-avian ecology are presented below. The table has been condensed from the original text to focus on specific relevant scope notes/actions. Comments in the Pre-Application consultation response that were also included in the EIA Scoping Opinion have not been repeated.
- 6.2.13. *Post submission consultee responses to the planning application (Ref. No: ECU00004900) which relate to non-avian Ecology are included in Table 6-1.*
- 6.2.14. It should be noted that some responses, such as that from NatureScot, included issues related to ornithology. Where these are easily divested from non-avian ecology issues, such responses have been excluded from Table 6-1. See **AI Chapter 7: Ornithology** for ornithology-related responses.
- 6.2.15. **AI Chapter 5: Landscape and Visual** should also be consulted for NatureScot responses related to Landscape.

Table 6-1: Consultation

Consultee	Pre-Application Comments (November 2020)	Scoping Comments (September 2023)	Applicant Response/Where addressed within this Report
Dumfries and Galloway Council	The key ecological planning constraints affecting this site include the following: - Site covered by carbon rich soils, deep peat and priority peatland habitat. - Laughenghie SSSI situated 500 m to west of site boundary. - Watercourses situated within the site. - Fleet Valley National Scenic Area situated 4.2 km to the west of the site. Galloway Hills Regional Scenic Area situated 1km to the west of the site and 4 km to the north east. - Gatehouse of Fleet Conservation Area situated to south west. - Galloway and Southern Ayrshire Biosphere - Transition Area.	The response from DGC reiterated the need cited by SEPA for NVC survey and that phase 1 and 2 peat survey will be required in tandem with a mitigation strategy within a Peat Management Plan (PMP). The need for a biosecurity plan, to avoid spread of the invasive American signal crayfish <i>Pacifastacus leniusculus</i> (present within Woodhall Loch and other near-by water courses), was also noted. It is noted that responses were received prior to implementation of National Planning Framework 4 (NPF4) which was introduced in February 2023. As such, any future Environmental Assessment Impact Report (EIAR) will adhere to NPF4 to conserve, restore, and enhance biodiversity.	The policies within the Local Development Plan have been adhered to. On application of mitigation and with regard to Designated Sites and National Scenic Areas, the Proposed Development will consider and respect site topography and surrounding natural landmarks, and will be sited, as far as practicable, to retain natural features that contribute to biodiversity. Deep peat, Ground Water Dependant Terrestrial Ecosystems and watercourse features have been avoided insofar as possible (as shown on Figure 8-1 and Figure 8-6 in Volume 4 & Chapter 8: Hydrology, Geology and Hydrogeology in Volume 2 of the 2025 EIA Report). Phase 1 Habitat, Protected Species and NVC surveys were carried out in accordance with current guidance and best practice. Details of which can be found in Section 6.4. Phase 1 and 2 peat probing have been undertaken and inform both the PMP (TA 8-2) and approach to restoration in identifying Priority Peatlands and their condition. Measures to avoid spread of the invasive American signal crayfish are included in the Construction Environment Management Plan (TA 15-1). Enhancements provide a significant benefit, as required under NPF4, are detailed in the Outline HMP (TA 6-6).
NatureScot (formerly Scottish Natural Heritage)	In terms of non-avian ecology NatureScot referred to their general pre-application and scoping advice for onshore wind farms (NatureScot 2022b), which contains advice for developers on the general considerations to inform the approach to environmental impacts for all onshore wind farms.	NatureScot is happy with the proposed scope for the assessment of Ecological receptors for the proposal. Similarly, the proposed peatland assessment seems appropriate. There is scope for micro-siting of infrastructure to further minimise potential impacts on peatland. Restoration options for peatland will be incorporated adhering to NatureScot guidance on priority peatland and ensure positive gain is achieved in terms of	General scoping and pre-application guidance for onshore wind farms and Priority Peatland guidance has informed the design evolution in order to avoid and minimise negative impacts. A detailed Outline HMP has been produced (TA 6-6). The design has evolved via active consideration of impacts on priority peat with dialogue between ecologists, the peat specialist, and engineers. Micro-siting has reduced impacts on this as much as possible and further micro-siting was effected following the NatureScot response. Chapter 8: Hydrology, Geology and

Consultee	Pre-Application Comments (November 2020)	Scoping Comments (September 2023)	Applicant Response/Where addressed within this Report
		biodiversity and carbon management. NatureScot expects that the habitat management plans are fully developed and explored within the EIA rather than left to the post consent stage.	Hydrogeology and Chapter 3: Description of the Development should be consulted for further information. Statutory Designated Nature Conservation Sites have been scoped out (see section 6.4.1). Protected species and habitat surveys have been conducted and ecological features at risk of negative impacts have been assessed within this report. Potential impacts on the Fleet Valley NSA are addressed primarily in AI Chapter 5 – Landscape and Visual .
Scottish Environmental Protection Agency	To avoid delay and potential objection, the information outlined below must be submitted in support of the application: • Map and assessment of all engineering activities in or impacting on the water environment including proposed buffers, details of any flood risk assessment and details of any related CAR applications. • Map and assessment of impacts upon Groundwater Dependent Terrestrial Ecosystems and buffers. • Map and assessment of impacts upon groundwater abstractions and buffers. • Peat depth survey and table detailing re-use proposals. • Map and table detailing forest removal. • Map and site layout of borrow pits.	SEPA set out information requirements relating to ecology based upon their best practice guidance and the previous scoping report: • Site Layout: that the works minimise the extent of new undisturbed ground in their footprint, and that pre-existing infrastructure be re-used or upgraded as often as possible. • Disturbance of Peat: the submission must demonstrate how the layout has been designed to minimise disturbance of peat and consequential release of CO₂. It must also outline preventative/mitigation measures to avoid significant drying/oxidation of peat. A Peat Management Plan must also be considered depending on the volume of peat likely to be encountered in the project. • GWDTE: must provide a map demonstrating that all GWDTE are outwith a 100 m radius of all excavations. A site-specific risk assessment is required if minimum buffers cannot be achieved. • Existing Groundwater: must include a map demonstrating that all excavations shallower than 1 m, and outwith 250 m of	All appropriate surveys and assessments have been undertaken including those informing the hydrological assessment, and which are covered in Chapter 8: Hydrology, Geology and Hydrogeology in Volume 2 of the 2025 EIA Report. Phase 1 Habitat and National Vegetation Classification (NVC) surveys were conducted, and included categorisation of ecological importance and which were passed to the hydrogeologist to establish GWDTE status. See Chapter 8: Hydrology, Geology and Hydrogeology in Volume 2 and Figure 8-6 in Volume 4 of the 2025 EIA Report. See AI Chapter 3: Description of the Development for detailed information on design iterations, and environmental considerations which informed these changes. In addition to this assessment, description of methods to address impacts on peat, are considered in the PMP (TA 8-2).

Consultee	Pre-Application Comments (November 2020)	Scoping Comments (September 2023)	Applicant Response/Where addressed within this Report
		all excavations deeper than 1 m and proposed groundwater extractions. If minimum buffers cannot be achieved, a site-specific risk assessment and appropriate mitigation will be required.	
Consultee	Post Submission Comments (July/August 2025)		Applicant Response/Where addressed within this Report
NatureScot	We are generally satisfied with the assessment and mitigation for protected species for both construction and ongoing activity at the site, which should be fully implemented if the proposal is approved. In relation to bats, we recommend further consideration be given to the curtailment strategy currently proposed for Turbine 7 and, should the proposal be consented, that the results of post construction monitoring are submitted annually to NatureScot so that any necessary additional mitigation can be agreed. Since submitting our scoping advice, we have been alerted to the presence of Pine Marten in the area and advise that mitigation for this species be considered and implemented as part of the construction environment management plan and/or species protection plan. NatureScot's view is that the level of compensation proposed in the Outline Biodiversity Enhancement Management Plan (OBEMP), if implemented successfully, will meet the requirements of NPF4 to deliver biodiversity net gain. We offer additional recommendations on this matter in Annex III to this letter. Annex III – protected species Bats Given the relatively high levels of bat activity recorded at the site, particularly that of <i>Nyctalus</i> species, we are pleased to see that a mitigation is proposed, which includes curtailment at turbine 7. However, the report does not give a clear representation of temporal activity across the site and focuses almost exclusively on the period around sunset. The curtailment is proposed for 2 hours either side of sunset and sunrise, however their data suggest that there is relatively little activity before sunset and we would anticipate similarly low levels after sunrise. During late summer and early autumn when we would anticipate maximum bat activity, there would be approximately 6 hours during between 10:30 and 04:30 hours where no curtailment is proposed, even if there were optimal foraging conditions. Whilst we understand that peaks in bat activity can be bimodal during the night, a gap of up to 6 hours with no curtailment during optimal conditions is not ideal at a location where a significant amount of activity has been recorded for a high-risk		Following further analysis, the curtailment period at Turbine 7 has increased from the amount detailed in the EIA (from sunset until two hours after sunset and from 2 hours prior to sunrise until sunrise) as follows: The Revised Bat Curtailment Strategy (AI TA 6-7) recommends that Turbine 7 is inactive under optimal weather conditions for bat activity from 1st of June until 31st October, inclusive, during two periods of the night, 5-6 hours after sunset and 1-2 hours before sunrise. This will be operated by a 'smart' system reacting to weather variables as per NatureScot (2021).

Consultee	Pre-Application Comments (November 2020)	Scoping Comments (September 2023)	Applicant Response/Where addressed within this Report
	<i>species. A better option is one based on smart curtailment as per the approach described in Appendix 5 in our Bats and Onshore Wind Farms guidance, which would minimise turbine downtime whilst being able to deal with unexpected peaks in bat activity outside the proposed main curtailment period.</i> <i>We note also that 5 of the 8 turbines are located within 200 metres of the forest edge. Whilst this is well in excess of the minimum 50 metre buffer between blade tip and forest edge, these turbines are in a zone that is more likely to be regularly used by bats given the favourable habitat in the vicinity. In our view, there is potential for turbines other than T7 to attract bat activity, particularly as pre-construction surveys are not necessarily a reliable predictor of post construction bat collision risk. We are pleased that post-construction monitoring appears to be proposed at all turbines, not just T7, and that there is recognition that adaptation may be necessary across the site to manage potential bat interactions. In our view there is high likelihood at this site that PCM may reveal that further smart curtailment may be necessary at other turbines.</i> <i>Given this, should the proposal be consented, we request that annual reports including the full PCM survey data are submitted to ECU and NatureScot so that we can help inform the monitoring programme. It will also be useful for improving understanding of bat activity and wind farm interactions in a location that currently has limited wind farm activity.</i> <i>We note that the EIA makes no reference to turbine feathering, which we recommend is implemented as standard best practice where there are notable levels of bat activity. This alone can reduce fatality rates by up to 50% without any loss of output and should be implemented as best practice. It can be operated on any site with a blade pitch control system which can be automated using Supervisory control and data acquisitions (SCADA) data.</i> <i>Badger</i> <i>Presence of badger setts are confirmed at 4 locations within or close to the site boundary. The proposed 50m buffer should be adequate based on likely construction activities close to these setts. Given that there is activity in this area and therefore an increased likelihood that new setts could establish, the site should be subject to a thorough pre-construction check and appropriate mitigation adopted following our badgers development management guidance.</i>		<i>We agree that whilst turbines nearest the woodland edge have a higher risk of attracting bats we refer to the fact that the standard mitigation to provide a 50 m from tip was part of the EIA. As such, we don't propose to expand curtailment beyond Turbine 7 at this time but the note that the purpose of the 5 year Post Construction Monitoring (PCM) programme is that it is adaptive. Therefore wider curtailment would occur if fatalities warranted it. A bat death threshold would be implemented at each turbine, whereby curtailment will be implemented once three carcasses have been identified in the year. We note that NatureScot (2021) guidance requires three years minimum whereas the proposal is for five years. In addition one of the turbines nearest the woodland (Turbine 8) has been dropped.</i> <i>We confirm that annual reports will be provided along with full PCM data.</i> <i>The commitment to feathering was made in TA 6-3 of the EIA.</i> <i>As noted in section 6.6.2 of the EIA a pre-construction badger survey will be undertaken within 4 weeks of the start of construction. Following this survey, construction activity will be overseen by an EnvCoW who will iteratively repeat checks of areas to be cleared and advise the workforce if works should stop, or avoid/mitigate upon identification of a confirmed or suspected setts in current use (at the EnvCoW's discretion).</i>

Consultee	Pre-Application Comments (November 2020)	Scoping Comments (September 2023)	Applicant Response/Where addressed within this Report
	Pine Marten NatureScot has been alerted to the presence of pine marten in the area, particularly in relation to the proposed south western access route, and as a result we advise that necessary checks and mitigation for this species are included in the final construction environment management plan and species protection plan following our pine marten development management guidance. Great Crested Newt Habitat suitability index confirms a pond rated as 'good' for great-crested newt (GCN) approximately 280 metres from solar farm infrastructure. Records for GCN are 3 km distant from the development area. Whilst we agree that the surrounding habitat is not ideal for GCN, we are surprised that no presence absence or e-DNA data were collected for this pond. The assumption that newts, should they be present, will not move in the direction of the proposal due to the habitat being less suitable may mean that the risk is lower but does not mean that there is no potential for damage or disturbance, which could constitute an offence. Should the application be approved, we would advise that the EcoW has a clear brief to check for any GCN construction activity that takes place within 500m of this pond. It might be advisable to undertake a presence/absence survey prior to works commencing, which would make the situation clearer. Western access route The report states that no survey has been undertaken along the proposed western access route but that this does not alter the findings of the EIAR. Nevertheless, there is a clearly potential for impacts to protected species due to construction and ongoing access. The route should therefore be subject to the same prescriptions for preconstruction survey as for the rest of the site and if necessary appropriate mitigation introduced. We note in section 6.6.3 the intention to maintain a 15-mph speed restriction for construction vehicles. This should be rigidly enforced across the whole site to minimise risk to protected species. Biodiversity enhancement A main aim of the Outline Habitat Management Plan (OHMP) will be to improve the condition of degraded peatland on the site, which is currently impacted by a significant network of drains. Whilst drain blocking can be an important tool in peatland restoration, it is very often the case where sites have been significantly damaged, that additional measures may be required to deliver meaningful restoration. The final Habitat		Surveys on the western track found no evidence of pine marten resting places, although scats were found. This species will be included in pre-construction surveys, and the 50 m micro-siting allowance will be used to avoid potential den sites, should they be present. As presence is confirmed, a Species Protection Plan (SPP) will be produced post-consent. As it is acknowledged that the potential disturbance distance to a confirmed breeding den site is 100 m, should it not be possible to avoid such a resting place, works would cease until an appropriate derogation licence was in place from NatureScot. Regarding GCN: a Habitat Suitability Index survey will be repeated in within 4 weeks of the start of construction upon the pond and terrestrial habitat by the EnvCoW or Suitably Qualified Ecologist. Protected species surveys for the western access route have been incorporated within this revised Chapter with updates to the impact assessment. As part of the construction area the 15 mph speed limit would apply to the access route as well as the remainder of the Proposed Development Site.

Consultee	Pre-Application Comments (November 2020)	Scoping Comments (September 2023)	Applicant Response/Where addressed within this Report
	<i>Management Plan should have clear targets ascribed to measure the success of restoration works and should be an evolving document that allows adjustment to management and the consideration of additional measures if required. NatureScot has amassed significant knowledge in peatland restoration through the peatland action programme and we would advise reference to these resources when developing restoration plans. We would strongly encourage seeking the services of a specialist peatland restoration consultant to fully assess the site and provide a plan that will deliver the required restoration outcomes.</i>		<i>The OHMP was always intended as an iterative document. It is noted that measures in addition to ditch-blocking, and which could be considered 'non-standard', were included in the version submitted with the 2025 EIA; i.e. to reduce the dominance of purple moor-grass <i>Molinia caerulea</i> and increase the presence and diversity of bog-mosses <i>Sphagnum</i> species. One of Scotland's foremost peat specialists helped to devise this aspect of the HMP. Notwithstanding, NatureScot's comments are noted in that measures to re-wet the Proposed Development Site will evolve in tandem with advancing knowledge of these techniques, and always using appropriately trained specialists.</i>
Galloway Fisheries Trust	<i>With regard to this development we would like to make the following comments:</i> <i>• Suitable fish surveys using electrofishing should be undertaken to inform EIA's for windfarms where suitable water courses are present. This data is required for an EIA to adequately consider the potential impacts from constructing a windfarm and are required we believe to design river crossings, consider suitable pollution prevention plans etc. There are a number of watercourses within this windfarm site that are known to be sensitive for their fish populations. It is unacceptable that this EIA has not considered the fish populations which are present within the site boundaries - this ignores Marine Directorate advice on surveys for fish / aquatic invertebrates for windfarm developments.</i> <i>• As recommended by Marine Directorate for windfarm developments, and supported by GFT, there is a need to have a robust fish monitoring plan which includes baseline, during and post construction monitoring - if these surveys identify an impact then mitigation works need to take place to return to baseline conditions. A fish survey should have been undertaken to support the 2025 EIA. Marine Directorate advice: https://www.gov.scot/publications/monitoring-watercourses-in-relation-to-onshore-wind-farm-developments-generic-monitoring-programme/</i> <i>• We are disappointed that the applicant had not contacted ourselves or the Kirkcudbrightshire Dee District Salmon Fishery Board at any point to discuss potential fisheries issues for this location. We note that at the scoping stage it was proposed to scope out fish but no actual discussions were held with any fisheries organisations.</i> <i>• It is incorrect for the developer to state that fish are not a consideration for this site. The details that the developer included in the Marine Directorate Check List are also incorrect. The outlined development site for the proposed wind farm and solar units cover a number of significant water courses. Loch Mannoch - which is inaccessible for migratory fish due</i>		<i>We acknowledge that characterisation survey is needed for the application, and believe this should be Fish Habitat Survey (FHS) with a view to Electrofishing (EF) and Water Quality sampling starting post-determination, but pre-construction, and then repeated in the construction and post-construction periods. An error was made at the Scoping stage where the wrong Fisheries Trust was contacted by the ECU and for this reason GFT were late to be involved.</i> <i>We believe that insistence on electrofishing pre-determination is unjustified (for the reasons set out below) and that FHS and mitigation should be adequate for the determination of likely Significant Effects. We do not consider that population and species mix (as determined by EF) has any bearing on the design as it stands, nor on the mitigation proposed. Details of silt control measures, watercourse crossing design and water quality locations are all post consent issues that would be addressed as part of a condition. Construction could be up to five years or more in the future, and therefore the data could be out of date if undertaken now. We are committed to undertaking the Electrofishing in the year before construction.</i> <i>The FHS will form the basis of future EF and a Fish Monitoring Plan (FMP). A FHS survey was undertaken in April 2026 following a modified version of the methodologies developed by Hendry and Cragg-Hine (1997), and the Scottish Fisheries Co-ordination Centre (2010) (see AI TA 6-9: Fish Habitat Survey and Outline Sampling Locations for Future Fish Monitoring Plan). The survey included outline control and sample points for this purpose chosen based on</i>

Consultee	Pre-Application Comments (November 2020)	Scoping Comments (September 2023)	Applicant Response/Where addressed within this Report
	<i>to a dam - supports a large wild Brown trout population which has in the past supported a popular wild trout fishery. There is no evidence to suggest the loch does not continue to support a healthy trout population. This trout population is dependent totally on natural spawning in tributaries entering the loch including the Anstool Burn. This burn lies within the development site as do other smaller tributaries. The development site continues to the north east of the loch which covers the outflow from the loch i.e. the Tarff Water. The Tarff supports many protected species including Atlantic salmon, Sea / Brown trout, European eels and lamprey species. The section of Tarff within the development site, upstream of Kirkconnell, is likely to include populations of these protected fish. The developer also needs to consider the possible impact that works associated with the main access routes could have on fisheries. The TA 8-3: Schedule of Watercourse Crossings highlights that the water courses at WX 3, 6 and 8 are significant in size so would be expected to support sensitive fish populations. This includes crossing the Glengap Burn, another important trout spawning tributary of the Loch Mannoch. As well as water course upgrades / new crossings clearly the roads will need to be upgraded which could cause pollution issues. All of these potential impacts need to be considered.</i> <i>• As described in the point above there are plenty of significant water courses within the development site that would be expected to support sensitive fish populations, including Brown trout spawning tributaries around Loch Mannoch and the accessible areas of the upper Tarff Water which could be supporting Atlantic salmon, trout and European eel. Fish surveys should be undertaken in these water courses to allow the EIA to consider potential impacts and allow a robust Fisheries Monitoring Plan to be delivered if the development was to proceed. This data should be required prior to any decision on the development being made.</i> <i>• An effective biosecurity plan should be designed for the construction phase to ensure no invasive non-native species could be introduced to the development site.</i> <i>After careful consideration of the points raised above we wish to OBJECT to this Section 36 Application.</i>		<i>proximity to infrastructure, and accessibility (to afford access for Electrofishing). This included points near Watercourse Crossings 3, 6 and 8 which are of concern to GFT and raised in their response.</i> <i>We have contacted GFT to try to purchase fish data records to inform our assessment. They confirmed they do not hold any up-to-date fish data for the Proposed Development Site (although they stated they know historically there were sensitive and important fish populations present which could be impacted by the development and need to be considered).</i> <i>The revised Chapter 6: Ecology now includes fish and we have adapted the mitigation to account for their presence, as shown in Section 6.6. In addition to measures in the EIA and Construction Environment Management Plan (CEMP) this includes timing of works in watercourses.</i> <i>A Biosecurity Management Plan (BMP) would be implemented prior to construction lasting throughout the construction, operational and decommissioning periods.</i> <i>We would like to work with GFT in developing the future FMP and liaise with them at construction stage for advice on watercrossing and culvert design.</i> <i>Whilst we do not think electrofishing is necessary for the reasons described above as a result of liaison between GFT and Atmos, on behalf of the Applicant, it has been agreed that an electrofishing survey will be carried out in the summer of 2026, to inform the future FMP. As a result, GFT have lifted their objection to the Proposed Development.</i>

6.3 Methodology and Approach

Baseline Data Gathering

Desk Study

- 6.3.1. An ecological desk study was undertaken to identify nature conservation designations and records of protected or otherwise notable species in the local area using data purchased from South West Scotland Environmental Information Centre (SWSEIC), a local environmental records centre (LERC), and freely available online data.
- 6.3.2. A review of online data was undertaken in 2023, following a previous review in 2020, and the review of SWSEIC data was carried out in 2023.
- 6.3.3. Distances are taken from the approximate centre of the Proposed Development Site for the following Important Ecological Features (IEFs):
- Non-statutory designated sites up to 3 km;
 - Protected species records/records of high conservation significance (Scottish Biodiversity List, Schedule species from the Wildlife and Countryside Act 1981, local Biodiversity Action Plan species for up to from the centre of the Proposed Development); and
 - Records of mobile species (bats – 10 km).
- 6.3.4. *The desk study has not been repeated to include the study area resulting from inclusion of the Western access route. This is for two reasons: Firstly, that to do so would disproportionately increase the buffer given the long linear route. Secondly, the new track is comprised predominantly of an upgrade to existing track, with highly localised new areas to increase the curvature of the track to allow turbine blades to pass through. The majority of these very small areas cover what is mainly commercial plantation.*
- 6.3.5. *The track does not pass within, or is it adjacent to, any site designated for non-avian ecology features.*
- 6.3.6. CIEEM (2017) guidance notes the Zone of Influence (ZOI) should be decided based on sensitivity of the receptor and nature of the Proposed Development. Distances are not therefore proscribed. The distances shown above are considered appropriate based on experience by the author of working on projects of this type in this region of Scotland, and factor recommendation to extend the ZOI for mobile species stated in the guidance.
- 6.3.7. Only those features that relate to non-avian ecology are considered in this Chapter, with ornithological data being presented in **AI Chapter 7: Ornithology**.

Field Surveys

- 6.3.8. The results of the detailed ecological surveys undertaken are summarised in this Chapter, with more details provided in Technical Appendices, as shown in **Table 6-2**. A summary of the field survey used is provided below.

Table 6-6-2: Ecological Surveys Undertaken for the Assessment

Study	Date Undertaken	Location in EIA Report
Extended Phase 1 Habitat	September 2023, September 2020, March 2025	Technical Appendix 6-1
NVC Surveys	September 2023	Technical Appendix 6-2

Study	Date Undertaken	Location in EIA Report
Bat Surveys (automated, static)	April - September 2023 and August - September 2024	Technical Appendix 6-3
Protected Mammal Surveys	June 2023, March 2025	Technical Appendix 6-4
<i>Fish Habitat Survey</i>	<i>April 2026</i>	<i>Technical Appendix 6-9</i>

- 6.3.9. Access to the Wind Development area of the Proposed Development is anticipated to be from the South West travelling north on the B727 before turning onto a (private) existing forestry track through the Glengap Forest for approximately 7 km before entering the Proposed Development Site boundary to the south.

Extended Phase 1 Habitat Survey

- 6.3.10. As detailed in **TA 6-1** in **Volume 3** of the **2025** EIA Report, the extended Phase 1 habitat survey was carried out in September 2023 to update a previous survey undertaken in September 2020. The survey on both occasions was within the Proposed Development Site.
- 6.3.11. The survey involved mapping areas of habitat greater than 0.1 ha and listing target notes to describe significant features as per Joint Nature Conservation Committee (JNCC) (2010). These included features with the potential to support protected or otherwise notable species that may require further survey.
- 6.3.12. The results are shown on **Figure 6-3** in **Volume 4** of the **2025** EIA Report.

National Vegetation Classification Survey

- 6.3.13. As detailed in **TA 6-2** in **Volume 3** of the **2025** EIA Report, the National Vegetation Classification (NVC) survey was carried out in September 2023. The results are shown on **Figure 6-4** of the **2025** EIA Report and **AI Figure 6-4**. The survey was within the Proposed Development Site.
- 6.3.14. All surveys were carried out in dry weather conditions with good visibility.
- 6.3.15. The NVC communities were mapped by eye and classified according to Rodwell (1995, 1998a, 1998b, 2006). Where possible, floristic samples were recorded to allow the habitat to be categorised later into the appropriate NVC classification. Small areas of interest and general descriptions of features were made using target notes as per Phase 1 habitat survey methodology (JNCC, 2010).
- 6.3.16. Higher plant nomenclature follows that of Stace (2020), bryophyte nomenclature follows that of Hill *et al.* (2008) and lichens follow Coppins (2002). Following the NVC survey, ecological importance among the recorded NVC communities was classified in terms of their potential groundwater dependence, based on SEPA guidance (SEPA, 2024).

Bat Surveys on the Wind Development

- 6.3.17. Automatic static surveys as detailed in **TA 6-3** in **Volume 3** of the **2025** EIA Report, bat surveys were carried out in April – September 2023, and in August – September 2024 in accordance with current survey guidelines (NatureScot 2021).
- 6.3.18. The surveys comprised three seasonal (spring, summer, and autumn), ground level automated surveys were carried out. A total of nine static detector locations were used to suitably represent the likely position of turbine locations as set out in the **2025** EIA Report.
- 6.3.19. The 2024 surveys surpassed that required under the NatureScot guidance but were carried out to better understand use and distribution of *Nyctalus* bats (Leisler's bat *Nyctalus leisleri* and/or noctule bat *Nyctalus noctula*) encountered in 2023 surveys as these are species at high risk from wind farm developments (NatureScot, 2021) and with limited distributions in Scotland.

- 6.3.20. Of the 18 UK bat species, ten occur in Scotland: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, Nathusius' pipistrelle *P. nathusii*, Natterer's bat *Myotis nattereri*, Daubenton's bat *M. daubentonii*, noctule bat *Nyctalus noctula*, brown long-eared bat *Plecotus auritus*, Leisler's bat *N. leisleri* and whiskered/Brandt's bat *M. mystacinus/M. brandtii* bats.
- 6.3.21. Of these ten species Brandt's bat is extremely rare in Scotland therefore it is considered likely that nine of these species are present in the region of the Proposed Development Site (NatureScot, 2024).
- 6.3.22. In addition to the above, several bat species are included within the Scottish Biodiversity List, including Brandt's, Daubenton's, whiskered, Natterer's, noctule, Nathusius', common pipistrelle, soprano pipistrelle, and brown long-eared bat.
- 6.3.23. NatureScot guidance for bats and onshore wind turbines (NatureScot, 2021) provides guidance on the risk levels from wind farm developments associated with Scottish bat species, based on physical and behavioural characteristics and from evidence of casualty rates in UK and the rest of Europe.
- 6.3.24. **Table 6-3**, reproduced from the NatureScot guidance, shows the levels of risk derived for key species.
- 6.3.25. **Table 6-4**, also reproduced from NatureScot guidance, takes relative population sizes into account, and presents the levels of risk at population level. Appendix 1 in the guidance sets out the different physical and behaviour characteristics of bats and assigns a different risk category to each characteristic, allowing each bat species to then be categorised by risk (**Table 6-3**).

Table 6-6-3: Bat Species Likely to be at Risk from Wind Turbines

Low Risk	Medium Risk	High Risk
Brown long-eared bat	<i>Not Applicable</i>	Common pipistrelle
Daubenton's bat	<i>Not Applicable</i>	Soprano pipistrelle
Natterer's bat	<i>Not Applicable</i>	Nathusius' pipistrelle
Whiskered bat	<i>Not Applicable</i>	Noctule bat
Brandt's bat	<i>Not Applicable</i>	Leisler's bat

Table 6-6-4: Bat Populations Likely to be Threatened Due to Impacts from Wind Turbines

Low Risk	Medium Risk	High Risk
Brown long-eared bat	Common pipistrelle	Nathusius' pipistrelle
Daubenton's bat	Soprano pipistrelle	Noctule bat
Natterer's bat	Whiskered bat	Leisler's bat
	Brandt's bat	

- 6.3.26. Five species are identified to be of high risk from wind turbine mortality: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat and noctule bat. This is due to factors such as habitat preference, echolocation characteristics, wing shape, flight speed, flight behaviour and use of landscape, hunting techniques and migration strategies.
- 6.3.27. Common and soprano pipistrelle bats and *Myotis* species do cross open spaces; however, they are relatively less likely to fly at a height that will bring them into contact with a turbine blade. Despite this, based on research, they have been categorised as high risk. Noctule and Leisler's bats, and Nathusius' pipistrelle to a lesser extent, do fly at height and often cross open spaces, making them "high risk" species because they exhibit all of the characteristics associated with species at high risk.
- 6.3.28. The risk of species being struck does not always translate into population-level effects and those species with smaller populations are more likely to encounter population-level effects.

- 6.3.29. As such, those species which show a high risk of collision and with smaller populations (noctule, Leisler's bat and Nathusius' pipistrelle) are considered most sensitive to negative effects from wind farm developments. Common and soprano pipistrelle, with typically much more robust populations, are considered less likely to have population-level effects (**Table 6-4**).
- 6.3.30. A full description of the methodology for bat call analysis is provided in **TA 6-3** in **Volume 3** of the **2025** EIA Report, a summary of the methodology is provided here.
- 6.3.31. Analysis of full spectrum .WAV files was undertaken firstly by Kaleidoscope (to convert the raw data into .ZCA files) and then Analook W software to enable identification of species.
- 6.3.32. All files were manually analysed to identify bat species and to separate common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus*. All sonogram files classified as "noise" by Kaleidoscope during the conversion process were then subject to manual checking of sonograms, and where bat calls were present, manual identification was undertaken.
- 6.3.33. Absolute measures of bat activity are not possible to reliably calculate for automated field studies as during an individual recording session, it is not possible to differentiate between one individual bat passing the detector ten times or ten different bats passing the detector on a single occasion.
- 6.3.34. As per NS guidance, a measure of relative bat activity can be obtained using the secure online tool "Ecobat" to compare data collected from the Proposed Development Site with bat survey information collected from similar areas at the same of the year and in comparable weather conditions.
- 6.3.35. Ecobat generates a percentile rank for each night of activity and provides a numerical way of interpreting the levels of bat activity recorded at a site across regions in Britain by producing a Bat Activity Index (BAI). It is currently the most objective method of assessing bat activity (Lintott & Matthews, 2018) (NatureScot, 2021).
- 6.3.36. Bat data was then processed to quantify risk both for the Proposed Development overall and for the individual species recorded during the surveys. Full descriptions of the risk assessment methodology are presented in **TA 6-3** in **Volume 3** of the **2025** EIA Report.

Bat Roost Potential surveys

- 6.3.37. As per NatureScot (2021) surveys included a search for key features that could support maternity roosts and significant hibernation and/or swarming sites within 200m plus rotor radius of the boundary of the proposed development.

Bat Surveys on the Solar Development

- 6.3.38. During protected species surveys any signs of bat roost potential features within 30m of infrastructure (e.g., holes within trees or structures) were recorded and considered in the evolving design process. NatureScot pre-application guidance for solar farms was updated in February 2025 and contains the following wording:

"Our standing advice for bats should be referred to inform survey, assessment, mitigation and any licensing requirements. Solar PV farm developments should be designed and constructed to avoid damage or disturbance to bat roost sites and to minimise any loss or fragmentation of foraging and commuting habitat. The risk of collision for solar PV farm developments is low so bat activity surveys are not required."

Protected Species Survey

- 6.3.39. Surveys for non-volant or non-flying protected species were undertaken during June 2023 with the findings presented in **TA 6-4** in **Volume 3** of the **2025** EIA Report. The survey was within the Proposed Development Site.
- 6.3.40. Whilst target species were considered to be otter *Lutra lutra*, water vole *Arvicola amphibius*, badger *Meles meles* and red squirrel *Sciurus vulgaris*, signs of other protected species, such as pine marten *Martes martes*, if present, would have been recorded as well. Additionally, any signs of bat roost potential features within 30m of infrastructure (e.g., holes within trees or structures) were recorded.
- 6.3.41. The otter survey followed standard methodologies (Purseglove, 1995; Chanin, 2003; Bang and Dahlstrøm, 2006; Muir and Morris, 2013); the water vole survey was conducted with reference to Strachan (2011); and the badger survey used the methodology in Harris *et al.* (1989).
- 6.3.42. Habitat Suitability Index surveys for great crested newt *Triturus cristatus* suitability were carried out on ponds as per the methodology outlined in ARG UK (2010). See **AI Figure 6-5**.

Fish Habitat Survey

- 6.3.43. *The methodology for FHS is complex and what is presented here is a summary. AI TA 6-9 should be consulted for fish habitat classifications and quality measures.*
- 6.3.44. *Rivers were surveyed within the survey boundary with an additional 500 m downstream and 100 m upstream, where accessible.*
- 6.3.45. *The survey method followed a modified version of the methodologies developed by Hendry and Cragg-Hine (1997), and the Scottish Fisheries Co-ordination Centre (2010) with areas of habitat defined as detailed in AI TA 6-9. Reference was also made to SEPA's 'Guidance for applicants on supporting information requirements for hydropower applications' (SEPA, 2005).*
- 6.3.46. *Spawning redds, where present and accessible, would be described in terms of stability, compaction and notes on the degree of siltation present within the spawning redds. In addition to notes on physical channel morphology, notes were also taken on bankside structure and surrounding land use.*
- 6.3.47. *SEPA's guidance for supporting requirements for hydropower applications uses a simpler classification namely, productive habitat, lamprey habitat, bedrock channel (unproductive) and obstacles to migration. The quality of the habitat was graded negligible to high. The assessment of the quality was determined at every survey point excluding obstacle features.*
- 6.3.48. *The survey comprised a walkover, noting physical morphology throughout the potentially impacted reach, as well as upstream and downstream with potential existing obstacles to migration being noted. The results of the survey were mapped and are presented in AI Figure 6-10.*
- 6.3.49. *Photos and target notes (TNs) were recorded in the context of varying fisheries habitat/flow types, and obstacles/barriers along the survey reach.*

Electrofishing Locations and Water Quality Monitoring Site Selection

- 6.3.50. *Points for future electrofishing and water quality monitoring were identified on the FHS survey. The sites were chosen for their proximity to accessibility and likelihood of containing the target species.*
- 6.3.51. *Additionally, the sites included areas where infrastructure will be within the vicinity of the watercourses or in areas where watercourses will be crossed. Upstream and downstream areas were chosen as potential sites to collect baseline data with areas outside of the Proposed Development Site boundary being identified downstream of these work areas.*

- 6.3.52. *These sample locations are indicative and will be refined through the pre-construction and construction periods where electrofishing and water quality sampling will occur as described in Section 6.6. See AI Figure 6-10 for details of locations.*

Limitations

- 6.3.53. The forestry plantation to the north and north-west which borders the Proposed Development Site where the existing western access track crosses through was inaccessible at the time of survey. As works for this track mostly comprises localised upgrades such as widening and resurfacing both within commercial plantation and improved agricultural grasslands, this is not considered to be a significant limitation.
- 6.3.54. Otherwise access was not limited within the Proposed Development Site, but was restricted in parts of the survey buffer. This is not considered a limitation as most of the infrastructure is contained within 250 m of the Proposed Development Site boundary and, where this is not the case, commercial plantation forestry abuts the boundary.
- 6.3.55. Both of the NVC survey and Phase 1 habitat survey were carried out in the beginning of September 2023 during the growing season and, as this is within the optimum timing for habitat surveys in Scotland, the timing of this does not present a limitation. It is possible that early flowering plants may have been missed; however, any effect is considered negligible as the habitats found are typical of upland situations with no species which could be missed (from a later visit) important in differentiating between them. The September visit is unlikely to affect the accurate classification of communities.
- 6.3.56. Due to the change in the proposed access route into the Proposed Development Site, the temporary construction compound was moved to the south west of the Wind Development area in January 2025. For further information see **AI Chapter 3: Description of Development** and **Figure 3-6 of the 2025 EIA Report**. This is covered by extended Phase 1 habitat survey data from 2020 but not from NVC data gathered in September 2023. This is because the Proposed Development Site boundary extended further south at the time of the 2020 survey but was reduced before the time of the 2023 NVC survey. The area not covered by NVC was re-surveyed in 2025, and results confirmed minimal change from the 2020 surveys. Approximately 2.38 ha wet modified bog will be lost in this area of which 1.36 ha is at 50 cm peat depth or more.
- 6.3.57. NVC mapping shows M15b wet heath, M25b mire and U20 bracken community present to the north of this area; satellite imagery suggests the wet modified bog is in keeping with those mapped areas.
- 6.3.58. As a result of the above, where loss will occur on peat of 50 cm depth or more (as recorded in Phase 1 and Phase 2 peat depth surveys), wet modified bog is assumed to be M25a mire because this is the prevailing habitat on the Proposed Development Site. These loss calculations have been factored into habitat loss tables **Table 6-9 and 6-16**.
- 6.3.59. There were no significant limitations concerning the static bat detector surveys. The 2024 survey effort was not conducted during spring and only focused on summer and autumn surveys. However this is not considered a limitation, as there was very little bat activity recorded during the spring surveys of 2023; in addition, the 2024 surveys were conducted to supplement the data collected in 2023 which adhered to NatureScot (2021) guidance. The 2024 surveys were supplementary to that.
- 6.3.60. Protected species surveys were conducted during suitable times of the year for the target species. Access within the Proposed Development Site was freely available. Areas outside of the boundary were only available for public roads and it was therefore not possible to follow the recommended guidance when surveying these areas in relation to appropriate survey buffers. This is not considered to have been a limitation factor in the results overall as areas outside the Proposed Development Site are typically set-back from the boundary.

- 6.3.61. *Up to 100 m either side of the Western access track was surveyed although complete access was not possible due to the dense nature of the primarily mature conifer plantation (some broadleaved trees were also present). However, the periphery of such dense stands were checked for mammal paths leading into/out of them. This limitation is discussed in the impact assessment.*
- 6.3.62. *Regarding the FHS, the Proposed Development was fully accessible within the red line boundary and around Loch Mannoch on the days surveyed. Water levels were considered to be normal and channel features, substrate and areas of fish habitat were fully visible and thus no limitations were associated with the habitat assessment. The weather conditions on the day of survey did not have any impact on the surveyors' ability to conduct a comprehensive survey.*
- 6.3.63. Taking account of the above no significant limitations were identified from any survey used to inform this *revised* Chapter of the *AI Report*.

Significance Criteria

- 6.3.64. The key objective of field and data analysis is to identify those receptors liable to comprise likely significant effects as a result of the Proposed Development. The CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2024) (henceforth referred to as the CIEEM guidelines) form the basis of the impact assessment presented in this chapter.
- 6.3.65. The CIEEM guidelines set out a process of identifying the value of each ecological receptor and then characterising the impacts that are predicted, before discussing the effects on the integrity or conservation status of the receptor, proposed mitigation and significance of effects of any residual impacts predicted.
- 6.3.66. The following definitions of the terms 'impact' and 'effect' are used in this chapter:
- Impact – actions resulting in changes to an ecological feature. For example, the construction activities of a development removing a hedgerow; and
 - Effect – outcome to an ecological feature from an impact. For example, the effects on a dormouse population from loss of a hedgerow.
- 6.3.67. The initial action for any ecological impact assessment is to determine which features should be subject to detailed assessment. Those ecological receptors subject to more detailed assessment should be of sufficient value that impacts upon them could result in effects which are significant in terms of either legislation or policy. The receptors should also be vulnerable to significant impacts arising from the Proposed Development.
- 6.3.68. All designated nature conservation sites, plant and animal species, habitats and integrated plant and animal communities that occur within the Zone of Influence (ZoI) of the Proposed Development are defined as potential ecological features (as described below).
- 6.3.69. The ZoI for a project is defined here as the area over which ecological features may be affected by biophysical changes as a result of the Proposed Development and associated activities.
- 6.3.70. The ZoI is likely to extend beyond the Proposed Development Site, for example where there are ecological or hydrological links beyond the Proposed Development Site boundary. The ZoI will also vary for different ecological features, depending on their sensitivity to environmental change.

Determining Value

- 6.3.71. The CIEEM guidelines recommend that the value of ecological features is determined based on a geographic frame of reference. For this project the following geographic frame of reference is used:

- International (nature conservation designation, habitat or populations of species of international importance, e.g., a Special Area of Conservation (SAC) or significant numbers of a designated population outside the designated site);
- National (nature conservation designation, habitat or populations of species of Scottish importance, e.g., a Site of Special Scientific Interest (SSSI) or a National Nature Reserve (NNR), a nationally important population / assemblage of a European Protected Species and / or a species listed on Schedule 5 of the Wildlife and Countryside Act 1981);
- Regional (nature conservation designation, habitat or populations of species of D&G area importance, e.g., a site / population that meets SSSI designation criteria but has not been designated due to better examples being present in the regional area or a regionally important population / area of an SBL priority species / habitat);
- County (Metropolitan, County, vice-county or other local authority-wide area);
- Local (a nature conservation site, habitat, or species of importance in the local or district area, e.g., a breeding population / viable area of an SBL or local BAP species / habitat); and
- Less than local (unremarkable habitat / common species of little or no intrinsic nature conservation value).

6.3.72. In this assessment, ecological features of local or higher value are considered Important Ecological Features (IEFs) and subject to detailed impact assessment, unless the risk of significant effects can be ruled out.

Valuing Habitats

- 6.3.73. The value of habitats, according to the CIEEM guidelines, is measured against published selection criteria where available. Reference may therefore be made to both the SBL and Habitat Action Plans (HAPs) contained within the D & G Local Biodiversity Action Plan (Dumfries & Galloway Biodiversity Partnership, 2009).
- 6.3.74. As the guidelines note, the presence of a HAP reflects the fact that the habitat concerned is in a sub-optimal state and hence the action plan is required and a HAP does not, therefore, necessarily imply any specific level of importance for the habitat.
- 6.3.75. It must be noted that features may be assigned greater value if there is reasonable chance that they can be restored to a higher value in the future as per the requirements of the guidance.
- 6.3.76. Notwithstanding the above, the principal guidance driving compensation and enhancement is the 1:10 loss to compensation ratio and a further 10% enhancement requirement for priority peatland habitats, as set out in guidance (NatureScot, 2023).
- 6.3.77. The enhancement fraction is considered to be 10% of potential National interest Priority Peatlands, which at the Proposed Development are M17 mire and M18 mire and associated sub-communities. See sections below and the Peat Management Plan (**TA 8-2**) for further information.

Valuing Species

- 6.3.78. In assigning a level of value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. Rarity is an important consideration because of its relationship with threat and vulnerability.

- 6.3.79. However, because some species are inherently rare, it is necessary to look at rarity in the context of status. A species that is rare and declining should be assigned a higher level of importance than one that is rare with a stable population.
- 6.3.80. Reference may also be made to SBL and Species Action Plans (SAPs) contained within D & G Local Biodiversity Action Plan (2009) and other indicators of conservation status, as appropriate, although, as above with HAPs, the existence of an SAP does not necessarily imply any specific level of importance.

Predicting and Characterising Impacts and Effects

- 6.3.81. The CIEEM guidelines suggest that the process of predicting ecological impacts and effects should take account of relevant ecosystem structure and function such as:
- Available resources – e.g., territory, food and water;
 - Environmental process – e.g., flooding, erosion, eutrophication, deposition and climate change;
 - Ecological processes and relationships – e.g., population dynamics, vegetation dynamics and predator / prey relationships;
 - Human influences – e.g., animal husbandry, burning, pollution, disturbance from public access; and
 - Historical context – e.g., natural range of variation, historical human influences, and geomorphological evolution.
- 6.3.82. In accordance with the CIEEM guidelines, when describing impacts and effects, reference is made to the following, where appropriate:
- Confidence in predictions – the level of certainty that an impact will occur as predicted, based on professional judgement and where possible evidence from other schemes – this is based on a four-point scale: certain / near certain; probable; unlikely; and extremely unlikely;
 - Magnitude – the size of an impact in quantitative terms where possible;
 - Extent – the area over which an impact occurs;
 - Duration – the time for which an impact is expected to last;
 - Reversibility – a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A temporary impact is one from which a spontaneous recovery is possible; and
 - Timing and frequency – i.e., whether impacts occur during critical life stages or seasons.
- 6.3.83. Both direct and indirect impacts are considered:
- Direct ecological impacts are changes that are directly attributable to a defined action, e.g., the physical loss of habitat occupied by a species during the construction process; and
 - Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process, or receptor, e.g., external sourcing of stone for road surfaces may cause growth of plant species not generally found in that area of the Proposed Development Site.
- 6.3.84. The potential for cumulative effects was also considered. Cumulative effects can arise from individually insignificant but collectively significant actions taking place over a period of time or

concentrated in a location. Ecological features may already be exposed to pressure and further impact could cause irreversible decline (CIEEM, 2024).

6.3.85. Developments within 10 km of the Proposed Development were identified as this is considered to be the maximum Zol for ecological receptors. In line with CIEEM guidance, the following development types were included:

- Proposals for which planning consent has been applied for which are awaiting determination in any regulatory process;
- Projects which have been granted planning consent, but which have not yet been started or which are under construction;
- Proposals which have been refused planning permission, but which are subject to appeal, and the appeal is undetermined; and
- To the extent that their details are in the public domain, proposed projects that will be implemented by a public body but for which no consent is needed from a competent authority.

Significant Effects

6.3.86. For the purposes of Ecological Impact Assessment (EclA), the CIEEM guidelines define a significant effect as; “...an effect that either supports or undermines biodiversity conservation objectives for important ecological features or for biodiversity in general”.

6.3.87. Significant effects can be either positive or negative and are qualified with reference to an appropriate geographic scale, from international to local, however, it should be noted that the scale of significance of an effect may not be the same as the geographic context in which the feature is considered important.

6.3.88. For example, an effect on a species which appears on a national list of species of principal importance for biodiversity may not have an effect on its national population.

6.3.89. Significance relates to the weight which should be attached to effects when decisions are made. Any significant effects remaining after mitigation (residual effects), together with an assessment of the likelihood of success of the mitigation, are the factors to be considered against legislation, policy, and development control in determining the application.

Mitigation, Compensation and Enhancement

6.3.90. It is important as part of any Environmental Impact Assessment to clearly differentiate between mitigation, compensation and enhancement and these terms are defined here as follows:

- Mitigation is used to refer to measures to avoid, reduce or remedy a specific negative impact in situ. Mitigation is only required for negative impacts assessed as being significant or where required to ensure compliance with legislation;
- Compensation is used to refer to measures proposed in relation to specific negative impacts but where it is not possible to fully mitigate for negative impacts in situ. Compensation is only required for negative impacts assessed as being significant or where required to ensure compliance with legislation; and
- Enhancement is used to refer to measures that will result in positive ecological impacts, but which do not relate to either specific significant negative impacts or where measures are required to ensure legal compliance.

Assessment Areas

- 6.3.91. The assessment area for designated sites is up to 10 km, for non-statutory designated sites up to 3 km, and for all other receptors within the Proposed Development Site. *This excludes the Western access track as to include it would increase the buffer disproportionately incorporating IEFs where no impact pathway exists and thereby making the assessment unwieldy. This is in line with recent guidelines on the streamlining of EIA (Scottish Renewables, 2025) where the 'format will focus on proportionality in deciding what is required for consultees and decision makers to identify potentially significant environmental effects and how the information may be best presented'. (p.6).*
- 6.3.92. *This guidance notes there should be an emphasis on the site's important ecological features, as defined by relevant national and local policy and legislation (p.20) and the Western access track is not considered to apply given the overall low quality of habitats, and limited protected species interest in the vicinity.*
- 6.3.93. *As described in paragraph 6.4.12, of the five habitats found on the Western access track only one is brought forward to assessment (W17d Quercus petraea-Betula pubescens-Dicranum majus woodland) based on 54% of the available habitat in the Proposed Development Site.*
- 6.3.94. With respect to vegetation and most fauna the assessment focuses on areas extending up to 250 m from borrow pits or structures requiring foundations, and 100 m out from all infrastructure, i.e., areas which are considered to be potentially impacted upon by the Proposed Development.
- 6.3.95. The faunal surveys cover a wider area, so impacts have been assessed within the zone of impact appropriate for each receptor, which at its maximum accounts for otter up to 200 m of infrastructure.
- 6.3.96. Given the mobility of bats, the ZOI extends to up to 10 km based on the presence of desk top records, but with priority given to the value of the Proposed Development Site itself, based on the 2023 and 2024 static survey findings.
- 6.3.97. There are instances where this distance is not maintained in relation to solar panels, but as excavations are not required for the solar installation, indirect effects (i.e. up to 250 m beyond the area of direct impact) are considered unlikely to be significant.

6.4 Baseline Conditions

- 6.4.1. The land cover within the Proposed Development Site is predominantly marshy acidic grassland in the southern parts, with modified blanket bog bordered by conifer plantation forestry in the north and northwest.
- 6.4.2. There are some small watercourses within the development boundary, namely the Anstool Burn and the Kirkconnell Linn. There is a body of water, Loch Mannoch, south of the Proposed Development Site boundary.
- 6.4.3. The settlement pattern in the wider area is characterised by scattered residences and farm houses with the nearest substantial settlement being the town of Gatehouse of Fleet located approximately 6.2 km from the Wind Development area of the Proposed Development.

Desk Study

Nature Conservation Designations

- 6.4.4. Statutory designated sites for non-avian ecological interests within 10 km of the Proposed Development Site are shown in **Table 6-5** and on **Figure 6-1** in **Volume 4** of the **2025** EIA Report.

- 6.4.5. Where sites have a combination of both ecological and ornithological features, ornithological features are not stated here; for any such designations refer to **AI Chapter 7: Ornithology**. For the sake of completeness, **Figure 6-1** in **Volume 4** of the **2025** EIA Report shows designations relevant to both ecology and ornithology.
- 6.4.6. 11 designated sites relevant to ecology were identified, nine SSSIs, one Ramsar Designation, one SAC and one NNR; as shown in **Table 6-5**.
- 6.4.7. Two non-statutory sites are considered potentially relevant to this assessment based on a 3 km distance of the Proposed Development Site (**Figure 6-2** in **Volume 4** of the **2025** EIA Report).
- 6.4.8. Ancient Woodland Inventory Sites adjacent to the Proposed Development Site are included (**Figure 6-2** in **Volume 4** of the **2025** EIA Report).

Table 6-6-5: Statutory and Non Statutory Nature Conservation Sites

Designated Sites	Designated Features	Distance from Proposed Development Site
Statutory		
Special Area of Conservation (SAC)		
Galloway Oakwoods	Western acidic oak woodland	4.2 km
Site of Specific Scientific Interest (SSSI)		
Woodhall Loch	Beetles (aquatic water beetles and a rove beetle <i>Stenus nitens</i>) Caddisfly (<i>Phaenocarpa brevipennis</i>) Fen meadow Oligotrophic loch Open water transition fen	3.5 km
Carstramon Wood	Upland oak woodland	4.2 km
Threave and Carlingwark Loch	Fen meadow	5.4 km
Killiegowan Wood	Upland oak woodland	6.3 km
River Dee (Parton to Crossmichael)	Dragonfly assemblage Lowland acid grassland Open water transition fen	6.5 km
Ardwall Hill	Upland assemblage Wet woodland	6.9 km
Cairnsmore of Fleet	Blanket bog Upland assemblage	7.6 km
Airds of Kells Wood	Upland mixed ash woodland Upland oak woodland	7.9 km
Skyreburn Grasslands	Fen meadow Lowland neutral grassland	9.4 km
Ramsar Site		
Loch Ken and River Dee Marshes	Beetles (aquatic water beetles) Vascular plant assemblage	5.4 km
National Nature Reserve		
Cairnsmore of Fleet	Overlaps with the Cairnsmore of Fleet SSSI (see above) and has the same designated features	7.6 km
Non Statutory		
Local Wildlife Site		
Culcaigrie & Trostrie Lochs LWS	Designated for its fen, willow carr and marshy grassland	3 km
Scottish Wildlife Trust		

Designated Sites	Designated Features	Distance from Proposed Development Site
Carstramon Wood	Oak, beech, birch and rowan woodlands well as bird interests	3 km
Ancient Woodland Inventory Site		
A 4.84 ha area	AW of Ancient (of semi-natural origin)	Adjacent

- 6.4.9. With the exception of the Ancient Woodland Inventory Site shown on **Figure 6-2**, all the above designations are scoped out of further assessment based on the separation distance from the Proposed Development Site.

Protected Species Records

- 6.4.10. Target species were identified as those that are either afforded specific legislative protection or represent qualifying interests in designated sites in the immediate wider area.
- 6.4.11. Valuations are not provided for desktop protected species records as they are considered as an indicator as to what may be found during surveys, only adding weight to valuations based on receptors found during surveys, if applicable (i.e. where records are likely to be connected to the Proposed Development Site by means of proximity, or habitat connectivity).

Table 6-6-6: Protected Species Historical Records

Species	Summary of Records and Distance from the Proposed Development Site
Adder <i>Vipera berus</i>	2 records 2016 & 2020, closest 3 km west
Common frog <i>Rana temporaria</i>	7 records 2013-2023, closest 2 km northeast
Common lizard <i>Zootoca vivipara</i>	11 records 2013-2023, closest 1.5 km southwest
Common toad <i>Bufo bufo</i>	7 records 2013-2019, closest 1 km east
Great crested newt <i>Triturus cristatus</i>	3 records from 2022, closest 3 km northeast
Badger <i>Meles meles</i>	9 records 2013-2023, closest 1 km northwest
Otter <i>Lutra lutra</i>	3 records from 2023, locations unknown
Red squirrel <i>Sciurus vulgaris</i>	68 records 2013-2021, mostly from Laurieston Forest
Common pipistrelle <i>Pipistrellus pipistrellus</i>	51 records 2013-2019, closest 2.5 km northeast
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	55 records 2013-2016, closest 0.5 km south
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>	3 records from 2016, closest 6 km south
Pipistrelle bat species <i>Pipistrellus sp.</i>	51 records 2013-2017, closest 3 km north
Daubenton's bat <i>Myotis daubentonii</i>	26 records from 2016, closest 2.5 km southeast
Natterer's bat <i>Myotis nattereri</i>	32 records from 2016, closest 2 km northeast
Whiskered bat <i>Myotis mystacinus</i>	1 record from 2018, 7 km southwest
Whiskered/Brandt's bat <i>Myotis mystacinus/brandtii</i>	19 records from 2016, closest 3.5 km northeast
Myotis bat species <i>Myotis spp.</i>	28 records from 2016, closest 2 km northeast
Nyctalus bat species <i>Nyctalus spp.</i>	6 records from 2016, closest 6 km southwest
Leisler's bat <i>Nyctalus leisleri</i>	42 records 2014-2022, closest 2.5 km northeast
Noctule bat <i>Nyctalus noctule</i>	21 records from 2016, closest 5.5 km southwest
Brown long-eared bat <i>Plecotus auritus</i>	19 records 2013-2016, closest 3 km northeast
Unidentified bat <i>Chiroptera</i>	2 records 2014 & 2018, closest 5 km east

Field Surveys

- 6.4.12. Field survey information is preceded by species records in the relevant sections below to provide context, and to provide an accurate baseline understanding. *For all but the Western access track survey coverage was limited to the Proposed Development Site boundary. On the Western access*

the area covered was up to 100 m from the track, where access was available (see Limitations 6.3.61).

Extended Phase 1 habitat survey

- 6.4.13. As shown in **TA 6-1** and **Figure 6-3** the Proposed Development Site is dominated by marshy grassland, and, at lower elevations, wet modified bog. The Proposed Development Site rises to the north/northeast with ridges of higher land orientated on a north/south axis.
- 6.4.14. Habitats in this part of the Proposed Development are dominated by marshy grassland, semi-improved acid grassland, bracken *Pteridium aquilinum* and dry dwarf shrub heath. Elsewhere, and particularly to the west and in the far north, wet modified bog is dominant. There are several small watercourses flowing south or south-east.
- 6.4.15. Two types of marshy grassland are present. The first and most widespread, is mature purple moor-grass *Molinia caerulea* grassland. Comprising the most dominant habitat within the Proposed Development Site, it is interspersed with occasional heather *Calluna vulgaris* and bilberry *Vaccinium myrtillus*.
- 6.4.16. Rush pasture is the second type, present in lower areas and adjacent watercourses. It is dominated by soft-rush *Juncus effusus* and sharp-flowered rush *Juncus acutiflorus*. Wet modified bog is present in the west spreading through the centre to the north. The absence of bog-mosses *Sphagnum* is notable.
- 6.4.17. Dwarf shrub heath is dominated by varying quantities, heather, deergrass *Trichophorum germanicum*, purple moor-grass and occasional crossed leaved heath *Erica tetralix*. These are characterised by the rush species referred to above, occasional *Sphagnum*, carnation sedge *Carex panicea* and broad-leaved pondweed *Potamogeton natans*.
- 6.4.18. Blanket bog is present in the north west, differentiated by the wet modified bog which proliferates elsewhere by the increased presence of sphagnum species which included *S. palustre* and *S. capillifolium*.
- 6.4.19. Conifer seedlings from seeds in plantations to the west and north occur sporadically throughout the northern part of the Proposed Development Site.
- 6.4.20. One small woodland, classified as semi-natural broadleaf woodland is present in the southwest, with two other patches of mixed woodland nearby, which lie just outside the southern Proposed Development Site boundary. An area of Ancient semi-natural woodland is present adjacent to the Solar Development in the southeast, as discussed in non-statutory designated sites in **Table 6-5**. This area was not accessible for survey.
- 6.4.21. Evaluations for habitats are provided in the NVC section, below.

National Vegetation Classification

- 6.4.22. As shown in **AI TA 6-8** and **AI Figure 6-4**, the survey recorded vegetation communities considered to be of potential conservation interest due to their status as Annex I habitats within the European Habitats Directive, appearing on the SBL, or by being classified as potential GWDTEs.
- 6.4.23. Where these communities were floristically distinct, they were assigned into corresponding sub-communities. NVC communities of particular interest recorded during the survey were:
- Mires, flushes and swamps: M17, M18, M23, M25, S8 and S9;
 - Grasslands and tall herb communities: U4 and U5;
 - **Open Habitats: OV23, OV27;**

- Heath: **H10**, M15; and
- Woodland: W9, W15 and **W17**.

- 6.4.24. These are described in further detail below. Analysis of GWDTEs in terms of their hydrogeological value is detailed in **Chapter 8: Hydrology, Geology and Hydrogeology** in **Volume 2** of the **2025** EIA Report.
- 6.4.25. In addition, the survey recorded MG7 *Lolium perenne* leys and related grasslands, U20 *Pteridium aquilinum-Galium saxatile* community and W23 *Ulex europaeus-Rubus fruticosus* scrub also occurred on within the Proposed Development Site; MG7 is an improved and poor semi-improved pasture type, U20 is continuous bracken and W23 is gorse scrub.
- 6.4.26. These have limited conservation value and are never ground water dependent. These communities are therefore not considered further in this report.
- 6.4.27. The Proposed Development is split between upland in the west, where the wind Development and BESS is intended, and lowland agricultural fields in the east, intended for the Solar Development.
- 6.4.28. The specific Annex 1 and SBL habitat types relevant to each NVC habitat is provided in Table 6-7.

Habitat Details

- 6.4.29. **M15 *Trichophorum germanicum-Erica tetralix* wet heath** – the typical sub-community of M15b *Scirpus cespitosus-Erica tetralix* wet heath, was found in the far south-west in the vicinity of the proposed turbine 4 and associated infrastructure. An area was also found in the far west, abutting the plantation where the ground drops from the drier M25 grassland in the vicinity of a burn.
- 6.4.30. As is typical with M15, overall, there was much variation within a wet-dry gradient. This was present in both M15b (the typical sub-community) and where more pronounced, could be split out into other sub-communities defined by the degree of wetness (as typified by grasses at one end of the spectrum, and *Sphagnum* moss the other). Cross-leaved heath *Erica tetralix* was a constant across all M15 types recorded.
- 6.4.31. Much smaller amounts of the grassier, M15d *Scirpus cespitosus-Erica tetralix* wet heath, the *Vaccinium myrtillus* sub-community, were found on higher areas as this is a drier sub-community. The grasses mat grass *Nardus stricta*, sheep's fescue *Festuca ovina* and also heather *Calluna vulgaris* were more common, as was the ubiquitous springy turf moss, *Rhytidiadelphus squarrosus*.
- 6.4.32. The M15a *Scirpus cespitosus-Erica tetralix* wet heath, the *Carex panicea* sub-community was highly localised, south-east of the proposed turbine 1. Differentiating species to M15a included *Sphagnum palustre*, bog asphodel *Narthecium ossifragum* and star sedge *Carex echinata*.
- 6.4.33. M15 is considered an Annex I and Scottish Biodiversity List priority habitat. The M15 encountered was a good example of its type with a range of characteristics given the different sub-communities present. It is considered a Local value IEF.
- 6.4.34. **H10 *Calluna vulgaris-Erica cinerea* heath** – *The H10 was dominated by Potentilla erecta, Salix cinerea and Calluna vulgaris. It was cored as a poor-quality example of this community, as there were numerous species present which are more common in waste ground, embankments or grassland habitats such as meadowsweet Filipendula ulmaria, grey willow saplings and bird's-foot trefoil Lotus corniculatus. This is because the area encompassing this community was relatively small and bordered areas of plantation forestry and roadside embankments, with encroachment of species from both of these into the dry heath habitat. Therefore, H10 at the Proposed Development Site is not considered to align with the Upland heathland SBL or Annex 1 European dry heaths and Alpine and subalpine heaths types.* It is considered a less than Local value IEF.

- 6.4.35. **M17 *Trichophorum germanicum*-*Eriophorum vaginatum* blanket mire** – M17 blanket mire is found in one discrete location in the north of the Proposed Development Site (centred on grid reference NX 63586 62683).
- 6.4.36. The area was dominated by *Sphagnum capillifolium*, purple moor-grass *Molinia caerulea* and common cottongrass *Eriophorum angustifolium* and *Sphagnum papillosum*. Bog asphodel was present as was round-leaved sundew *Drosera rotundifolia*.
- 6.4.37. The presence of the latter species indicates an affinity with M18 raised mire and it is noted the area sits within a depression as the land descends to the edge of the plantation.
- 6.4.38. M17 blanket bog is an Annex I habitat and a Scottish Biodiversity List priority habitat. It is considered a County value IEF.
- 6.4.39. **M18 *Erica tetralix*-*Sphagnum papillosum* raised and blanket mire** – The M18a sub-community is found at a single location at the north-east edge of the survey area towards the Solar Development (NX 66465 62224).
- 6.4.40. M18 is a community found on waterlogged, ombrogenous peats where the mire surface is rainwater fed rather than being influenced by groundwater. Located within a small depression with a domed profile, the discreet location was dominated by *Calluna vulgaris*, *Erica tetralix* and hare's tail cotton-grass *Eriophorum vaginatum*.
- 6.4.41. Cranberry *Vaccinium oxycoccus* was present and is regarded as a strong indicator of raised bog as is, although to a lesser extent, round-leaved sundew and *Sphagnum papillosum*. Other species included bog asphodel, *Sphagnum capillifolium* and bog-bead moss *Aulacomnium palustre*.
- 6.4.42. M18 bog is an Annex I habitat. It is considered a County value IEF.
- 6.4.43. **M23 *Juncus effusus*/*acutiflorus*-*Galium palustre* rush pasture** – The majority of M23 was found on the northern track leading into the Proposed Development Site, and to a lesser extent, in the far south of the Solar Development. Much of it aligned with the common, less species-rich M23b *Juncus effusus*/*acutiflorus*-*Galium palustre* rush-pasture, the *Juncus effusus* sub-community.
- 6.4.44. However, in some instances it was not possible to assign to a sub-community as quadrats returned a poor goodness of fit.
- 6.4.45. The prevalence of soft-rush *Juncus effusus* and grasses including tufted hair-grass *Deschampsia cespitosa*, false oat-grass *Arrhenantherum elatius* and species associated with disturbance (or tolerance thereof), including common nettle *Urtica dioica* and foxglove *Digitalis purpurea*, further indicate the less sensitive M23b sub-community.
- 6.4.46. The topographical position further tends toward the less flush-influenced M23b sub-community (and less likely to be GWDTE) as stands were typically in recently constructed ditches adjacent to the northern track, or depressions in agricultural fields.
- 6.4.47. Whilst M23 may form part of the SBL priority habitats Upland flushes, fens and swamps, and Purple moor-grass and & rush pastures communities, the type encountered is one which is commonly found within agricultural settings and which does not align with the species-rich M23a community, which is more likely to have a groundwater influence. Given the ubiquity of this habitat in the locality and that most of it was dominated by the species poor sub-community, M23b, M23 at the Proposed Development Site is considered a less than Local value IEF.
- 6.4.48. **M25 *Molinia caerulea*-*Potentilla erecta* mire** – M25 is a vegetation type found on well aerated, moist peat and peaty soils and which is generally overwhelmingly dominated by purple moor-grass. This habitat is dominant in the upland area of the Proposed Development.

- 6.4.49. The M25a *Molinia caerulea*-*Potentilla erecta* mire, the *Erica tetralix* sub-community dominates, and to a much lesser degree M25 stands that could not be assigned clearly to a sub-community due to a poor goodness of fit with the quadrat data.
- 6.4.50. M25a is typically the wetter form typified by species such as *Sphagnum capillifolium*, *Sphagnum palustre*, bog myrtle *Myrica gale* and cross-leaved heath *Erica tetralix*, albeit in reduced proportions to the purple moor-grass which was dominant.
- 6.4.51. Quadrats surveyed comprised purple moor-grass as the main constant, with other dwarf shrubs including heather and bilberry, although as a much smaller proportion of the habitat overall. The presence of a large purple moor-grass stool indicated that this habitat was well established in what was difficult terrain to cross.
- 6.4.52. Bog myrtle was present in lower-lying areas. Species diversity was low with forbs dominated by tormentil *Potentilla erecta* and smaller proportions of creeping buttercup *Ranunculus repens*, Devil's-bit scabious *Succisa pratensis* (c. <5% per quadrat), meadow buttercup *Ranunculus acris* (c. <2%) and marsh violet *Viola palustris* (c. <1%).
- 6.4.53. Across all M25 types the potential value of the habitats will align more closely with peat depth, rather than floristic community composition. When on deep peat (≥ 50 cm) M25 is considered to be the Annex I habitat H7130 Blanket bog and Scottish Biodiversity List priority habitat. It is considered a Local value IEF.
- 6.4.54. **S8 *Scirpus lacustris* spp. *lacustris* swamp** – At the banks of Loch Mannoch, the edge of the survey area covers an S8 *Schoenoplectus* (*Scirpus*) *lacustris* common or grey clubrush swamp, which was the only species recorded throughout the habitat. This abuts the S9 *Carex rostrata* swamp. S8 is further into Loch Mannoch than S9 as the former represents the deep-water limit of swamp vegetation in Britain (Rodwell, 1995).
- 6.4.55. S8 comprises the Upland flushes, fens and swamps/ Purple moor-grass and & rush pastures Scottish Biodiversity List habitats. It is considered a Local value IEF.
- 6.4.56. **S9 *Carex rostrata* swamp** – Landward of the S8 *Scirpus lacustris* ssp. *lacustris* swamp at the edge of Loch Mannoch the S9 *Carex rostrata* swamp was dominated by bottle sedge *Carex rostrata* at 75%, with broad-leaved Pondweed *Potamogeton natans* at less than 5%. The remaining area within the quadrat was open water. Flag iris *Iris pseudocorus* was present at the edge of the area suggesting a transition to M28 *Iris pseudocorus*-*Filipendula ulmaria* mire but which was too small to map.
- 6.4.57. S9 comprises the Upland flushes, fens and swamps/ Purple moor-grass and & rush pastures Scottish Biodiversity List habitats. It is considered a Local value IEF.
- 6.4.58. **U4 *Festuca ovina*-*Agrostis capillaris*-*Galium saxatile* grassland** – U4 is a pasture type found on base-poor but well-drained mineral soils in the upland fringes of north and west Britain. Across the survey area this community was found on high ground where rocky outcrops occurred.
- 6.4.59. Much of this area is found where bracken *Pteridium aquilinum* (U20) is found. The majority of this type was the U4a typical sub-community which is species poor and has no distinguishing features of its own (JNCC, 2004).
- 6.4.60. The U4a sub-community was characterised by a co-dominance of *Festuca ovina* sheep's fescue, *Agrostis capillaris* common bent and *Anthoxanthum odoratum* sweet vernal grass with mosses including *Hylocomium splendens*, *Rhytidiadelphus squarrosus* and *Hypnum jutlandicum*.
- 6.4.61. The U4b sub-community occurred in closer proximity to agricultural pasture (MG7 type) as evidenced by species indicating improvement such as rank grasses including Yorkshire fog *Holcus lanatus*,

false oat-grass *Arrhenantherum elatius* and cock's-foot *Dactylis glomerata* but also forbs such as yarrow *Achillea millefolium* and ribwort plantain *Plantago lanceolata*.

- 6.4.62. The surveyed U4 grasslands have low conservation interest showing a poor fit to the *Juncus squarrosus*-*Festuca ovina* grassland SBL habitat. It is considered a less than Local value IEF.
- 6.4.63. **U5 *Nardus stricta*-*Galium saxatile* grassland** – An area of U5d *Nardus stricta*-*Galium saxatile* grassland, the *Calluna vulgaris*-*Danthonia decumbens* sub-community is present in the south-central portion of the Proposed Development Site between the intended Wind Development and Solar Development.
- 6.4.64. The classification at U5d is based on the consistent presence of *Nardus stricta* mat grass in tandem with the dominant grass sheep's fescue, common bent and sweet vernal grass. The presence of mat grass was considered the differentiating factor between U5d and the U4a.
- 6.4.65. This grassland is considered to have low conservation interest showing a poor fit with the SBL priority of *Nardus stricta*-*Galium saxatile* grassland SBL habitat. It is considered a less than Local value IEF.
- 6.4.66. **OV27b *Epilobium (Chamaenerion) angustifolium* community, *Urtica dioica*-*Cirsium arvense* sub-community** – This community is most often situated on waste ground, railway embankments and roadside ditches – as is the case on this Site. It is dominated by rosebay willowherb *Chamaenerion angustifolium*, with other pioneering young tree species such as *Salix* spp. or fast-growing plants and grasses as it often occurs on ground which has been recently disturbed (Rodwell, 2000).
- 6.4.67. The examples of this community on the Proposed Development Site predominantly contained bracken as well as rosebay willowherb. There was also an abundance of common waste ground grasses and species such as common bent grass *Agrostis capillaris* and cock's-foot grass. Young trees were also occasionally present, including goat willow *Salix caprea*, sessile oak *Quercus petraea* and silver birch *Betula pendula*. Some bramble *Rubus fruticosus* scrub was also present, though not dominant. Its ecological interest is limited due to the dominance of rosebay willow herb and bramble. It is considered a less than Local value IEF.
- 6.4.68. **OV23 *Lolium perenne*-*Dactylis glomerata* community** – The OV23 community is present on flatter ground along the side of the access track where rosebay willow herb was far less frequently seen. This community also has a greater dominance of rye grasses and a lack of tree saplings.
- 6.4.69. Within the quadrats surveyed on site there was an abundance of red clover *Trifolium pratense* and cock's-foot grass as well as ribwort plantain *Plantago lanceolata*, which is typical of this community (Rodwell, 2000). Common dandelion *Taraxacum officinale* was also present. The examples of this habitat on the Proposed Development Site also contained scattered amounts of bramble scrub and so may have bordered on the W24 *Rubus fruticosus*-*Holcus lanatus* underscrub community in some examples. The ecological interest of this habitat is limited based on the low species richness and common species which dominate. It is considered a less than Local value IEF.
- 6.4.70. **W9 *Fraxinus excelsior*-*Sorbus aucuparia*-*Mercurialis perennis* woodland** – This is an area of W9b *Fraxinus excelsior*-*Sorbus aucuparia*-*Mercurialis perennis* woodland, the *Crepis paludosa* sub-community, the upland counterpart of the W9a sub-community. This dry, base-tending woodland was found within the Solar Development adjacent the A762.
- 6.4.71. The woodland was dominated by the canopy species hazel *Corylus avellana* and downy birch *Betula pubescens*, understorey by a 70% cover of broad-buckler fern *Dryopteris dilatata*, and a ground layer of 70% common tamarisk moss *Thuidium tamariscidium*. Other ferns included scaly male-fern *Dryopteris affinis* and *Pteridium aquilinum* bracken.

- 6.4.72. Whilst W9b can be of conservation interest, based on uncommon plants and presence of lichens (JNCC, 2004), this example is not considered to meet that threshold based on the low species diversity and lack of lichens. This example is therefore not considered to comprise the H9180 Mixed woodland on base-rich soils associated with rocky slope habitat. It is considered a Local value IEF.
- 6.4.73. **W15 *Fagus sylvatica*-*Deschampsia flexuosa* woodland** – Whilst typically a community of southern Britain, this assignation was considered appropriate based on the 90% dominance of planted beech *Fagus sylvatica* and understorey of bilberry.
- 6.4.74. Ground flora was sparse, apart from the bilberry with moss species dominated by *Thuidium tamariscidium* and *Dicranum majus*. The single stand was found at the northern most end of the northern access track, on the far side of the B road which borders the north of the proposed development site.
- 6.4.75. This woodland type does not align with nature conservation priorities. It is considered a less than Local value IEF.
- 6.4.76. **W17d *Quercus petraea*-*Betula pubescens*-*Dicranum majus* woodland** – *This community was found with mainly downy birch and silver birch, as well as a smaller amount of hardier tree species such as rowan Sorbus aucuparia and common hazel; typical of the W17d sub-community. Whilst W17 woodlands may align with either Annex 1 Western acidic oak woodland or Caledonian forest habitats, the woodland in the Proposed Development Site is not considered a good fit: As noted in quadrat data (see AI TA 6-8) species richness was low and the rich Atlantic bryophyte communities that are often well-developed within the Western acidic oak woodland Annex 1 type were lacking (JNCC, n.d.(a)). The woodland is not within the north of Scotland where Caledonian forest is found (JNCC, n.d.(b)) and lacked the associated old growth structure associated with it.*
- 6.4.77. *Whilst the W17d on the Proposed Development Site does not align directly with an SBL type, this does not preclude importance, as the list is somewhat coarse, and expert judgement is also required. It is noted that the list 'identifies the plants, animals and habitats that are of the most importance to biodiversity in Scotland' (NatureScot, n.d). On the basis that native broad-leaved woodland is rare on the Proposed Development Site, therefore W17d Quercus petraea-Betula pubescens-Dicranum majus woodland is regarded as an IEF on the basis that its importance is primarily confined to the Proposed Development Site itself or its immediate surroundings. It is considered a Local value IEF.*

Vegetation Community Summary

- 6.4.78. A number of the recorded communities are considered to have conservation value at a European level (Annex I) (European Commission, 2013) or at a national level (Scottish Biodiversity List). A summary of habitats and their designations are found in **Table 6-7**.

Table 6-6-7: Annex I, Scottish Biodiversity List Habitats and Priority Peatlands

NVC Code	Annex I	SBL Habitats	Priority Peatlands
M15	H7130 (Only applicable on peat ≥ 50 cm deep)	Blanket bog	On 50 cm or more
M15	The	Upland heathland	No
M17	H7130 Blanket bogs	Blanket bog	Yes
M18	H7110 Active raised bogs	N/A	Yes
M25	H7130 (Only applicable on peat ≥ 50 cm deep)	Blanket bog	On 50 cm or more
S8	N/A	Upland flushes, fens and swamps/ Purple moor-grass and & rush pastures	No

NVC Code	Annex I	SBL Habitats	Priority Peatlands
S9	N/A	Upland flushes, fens and swamps/ Purple moor-grass and & rush pastures	No

- 6.4.79. With regards to M15 and M25 peatland habitats as part of the Annex I H7130 designation, these communities are only classed as having Annex I quality if they adhere to certain criteria. For the H7130 Annex I classification the peat layer should be greater than 50 cm in depth and be capable of regeneration within a period of 30 years (European Commission, 2013).
- 6.4.80. For the community to regenerate within a period of 30 years there needs to be a *Sphagnum* assemblage capable of generating a peat layer. The main peat building *Sphagnum* species that form the bulk of the peat layer are *S. medium*, *S. papillosum* and to a lesser extent, *S. capillifolium*. Whilst these species are absent from the M15 and M25, given that *S. papillosum* and *S. capillifolium* is found elsewhere, if correct hydrology/grazing levels were in place there is the potential for it to become habitat of Annex 1 quality. However, this process is unlikely to happen without dedicated peatland restoration measures.
- 6.4.81. Of the recorded communities within the survey area in the current baseline, M17 and M18 exhibited this suite of *Sphagnum* species. Both the M17 and M18 communities are considered Annex I habitats.
- 6.4.82. M15 is considered to align with the Annex I habitat H4010 Wet heathland with cross-leaved heath.
- 6.4.83. The W9b *Fraxinus excelsior-Sorbus aucuparia-Mercurialis perennis* woodland, the *Crepis paludosa* sub-community woodland is not considered to comprise the H9180 Mixed woodland on base-rich soils associated with rocky slope habitat.

Potential GWDTE

- 6.4.84. Groundwater dependency is often linked to wetlands that contain flora that is dependent upon the chemical composition of the water fed from a groundwater source. SEPA (2024) defines the habitats with regard to their potential for groundwater dependency as identified above.
- 6.4.85. The potential groundwater dependency of the habitats identified in **Table 6-8** is discussed in **Chapter 8: Hydrology, Hydrogeology and Soils** in **Volume 2** of the **2025** EIA Report which determines that none of these habitats are dependent on groundwater.
- 6.4.86. On this basis, none of the habitats identified in **Table 6-8** are taken forward for assessment in **Chapter 8: Hydrology, Hydrogeology and Soils** in **Volume 2** of the **2025** EIA Report.

Table 6-8: Ecological Importance Criteria from SEPA (2024) for Potential GWDTEs

Community Code	Community Name	SBL, UK BAP, Annex I	Designated Nature Conservation Site Feature	Habitat Connectivity	Ecosystem Services Provided	Relative Extent in Scotland	Significant Decline / Unfavourable Condition	Importance for Supporting Species
M15	<i>Trichophorum germanicum</i> – <i>Erica tetralix</i> wet heath	SBL / Annex I	-	Limited as surrounded by poor quality M25 Molinia grassland, commercial forestry and lowland habitats to the east	Carbon storage, water attenuation	Widespread	Yes (as per SBL)	Yes (as per SBL)
M23	<i>Juncus effusus/acutiflorus</i> - <i>Galium palustre</i> rush-pasture	-	-	Limited. Small areas in lowland agricultural areas,	Water attenuation, Nutrient capture	Widespread	-	-

Habitat Loss Calculations

- 6.4.87. **Table 6-9** shows the areas of habitats recorded within the Proposed Development Site which will be lost to construction. The relative proportions of each habitat lost is compared against the baseline total area of habitat recorded within the Proposed Development Site. Habitats where there is no loss have not been included.
- 6.4.88. Temporary habitat loss, which is due to temporary infrastructure such as crane platforms, material storage, etc. has been classified as permanent loss where it occurs in areas of priority peatland. This is due to the sensitive nature of Peatland habitats and the potentially long regeneration periods that would be required for full restoration of these habitats in the event of any damage or degradation.
- 6.4.89. Indirect loss is assumed as 10 m from direct loss based on disturbance and drying out effects.
- 6.4.90. As noted in paragraph 6.3.57 and 6.3.58, approximately 2.38 ha wet modified bog will be lost in this area of which 1.36 ha is at 50 cm peat depth or more. This allocation of wet modified bog to M25a is split between less than 50 cm peat, or 50 cm or more and included in the relevant sections of **Tables 6.9 and 6.16**.
- 6.4.91. This is an area where extended Phase 1 surveys were carried out in lieu of an NVC survey. This is an area covered by a temporary construction compound and new access track. NVC mapping shows M15b, M25b and U20 to the north and satellite imagery to the south of that is very much in keeping with those mapped areas, in addition to grassland.
- 6.4.92. It is therefore assumed to be M25a as this is the prevailing habitat on the Proposed Development Site.
- 6.4.93. There may be minor discrepancies between totals due to rounding. Figures are to two decimal places.
- 6.4.94. NVC Communities taken forward for assessment have been highlighted separately in **Table 6-16**.

Table 6-9: Predicted Loss of Habitats Associated with the Proposed Development

Habitat Type NVC	Total Habitat in Proposed Development Site (ha)	Total Permanent Loss (ha)	Total Temporary Loss (ha)	Total Indirect Loss (ha)	Total loss (Permanent, Temporary and Indirect (ha)	Total Loss (Permanent, Temporary and Indirect (%)
Priority Peatland Habitats						
M15b on peat ≥ 50 cm	14.54	0.6	0.17	0.65	1.42	9.82%
M25 on peat ≥ 50 cm	9.04	0.17	-	0.28	0.45	6.57%
M25a on peat ≥ 50 cm	89.48	2.39	0.84	4.29	7.52	8.4%
Other NVC Habitats						
M15b on peat < 50 cm	13.39	1.19	0.21	1.57	2.97	22.16%
M23b	2.16	0.07	-	0.18	0.25	11.89%
M25 on peat < 50 cm	2.57	0.04	-	0.14	0.18	7.05%
M25a on peat < 50 cm	158.30	8.40	1.31	8.66	18.37	11.06
MG7	54.87	7.15	-	17.58	24.73	45.08%
U20	40.90	2.71	0.11	2.90	5.72	7.38%
U4	5.31	0.09	-	0.26	0.35	6.66%
U4b	1.15	0.04	-	0.20	0.24	21.14%
W23	4.87	0.16	-	0.41	0.57	11.69%
OV27b	6.39	0.35	-	2.23	2.23	34.91%

Habitat Type NVC	Total Habitat in Proposed Development Site (ha)	Total Permanent Loss (ha)	Total Temporary Loss (ha)	Total Indirect Loss (ha)	Total loss (Permanent, Temporary and Indirect (ha)	Total Loss (Permanent, Temporary and Indirect (%)
OV23	0.79	0.09	-	0.34	0.34	44.00%
U5d	12.98	0.62	-	3.05	3.05	23.56%
H10	2.04	0.2	-	1.11	1.11	54.73%
W17d	2.15	0.13	-	0.84	0.85	39.57%
Non-NVC	36.6	1.93	-	10.61	10.61	29%

Bats

6.4.95. Static bat detectors were deployed at nine locations over three visits in April, July, and September 2023 and two visits in August and September in 2024 in the same locations. Full spectrum bat detectors (Wildlife Acoustics Song Meter Mini Bats) were used. See **Figure 6-6** in **Volume 4** of the **2025** EIA Report.

6.4.96. The detectors were set up to record activity from 30 minutes before sunset to 30 minutes after sunrise for a period of at least 10 nights (Collins, 2023). **TA 6-3** contains detailed survey results.

2023

6.4.97. The results of the 2023 static detector deployment surveys identified the presence of at least five species; *Myotis* sp., *Nyctalus* sp., common pipistrelle, soprano pipistrelle and brown long-eared bat. The inability to differentiate *Myotis* sp. and *Nyctalus* sp. passes to species resulted in the identification to genus only.

6.4.98. A total of 3,715 passes were recorded throughout the year; 2% of the calls were recorded in the spring, 45% in summer and 52% in autumn. The majority of the calls were identified as *Nyctalus* sp., equating to approximately 65% of the total passes. Most of the remaining calls were evenly distributed between *Myotis* sp., common pipistrelle and soprano pipistrelle, 10%, 13%, and 10%, respectively, and very few were brown long-eared bat, 3%.

2024

6.4.99. The results of the 2024 static detector deployment surveys identified the same five species within the Proposed Development Site as in 2023: *Myotis* sp., *Nyctalus* sp., common pipistrelle, soprano pipistrelle and brown long-eared bat.

6.4.100. A total of 1,895 passes were recorded the two deployments, fewer than the previous year, and the vast majority were recorded during the summer, approximately 75%.

6.4.101. Similarly, the majority of passes recorded were identified as *Nyctalus* sp., making up approximately 40% of the total calls; slightly greater proportions of common pipistrelle and soprano pipistrelle were recorded, 20% and 29%, respectively, although the total number of passes were similar to that of the previous year. Little activity was recorded by *Myotis* sp. (approximately 7% - 147 passes and brown long-eared bat, approximately 4% - 85 passes).

6.4.102. More details of the results and analysis of the bat surveys can be found in **TA 6-3** in **Volume 3**.

Risk Assessment

- 6.4.103. A risk assessment of the Proposed Development Site was conducted according to NatureScot guidance (NatureScot, 2021). The initial risk assessment considers the size of the project and the quality of the habitat within the Proposed Development Site, see **Table 6-9**.
- 6.4.104. The Proposed Development Site is considered to be of medium size as there are fewer than 10 turbines, there are other small private wind farm developments within 5 km (1 to 2 turbines, and the turbine height is greater than 100 m).
- 6.4.105. The habitat is considered of medium quality roosting and foraging habitat for species as the Proposed Development Site is connected to the wider landscape through linear features such as tree lines and streams. Therefore, the overall score of the Proposed Development Site is 3 as highlighted below.

Table 6-10: Proposed Development Site Risk Assessment

Habitat Quality	Project Size		
	Small	Medium	Large
Low	1	2	3
Medium	2	3	4
High	3	4	5

- 6.4.106. A secondary risk assessment was conducted by comparing the Site risk assessment with the relative amount of activity within the Proposed Development Site per species. This is completed using the median and maximum percentiles of activity to produce four tables, two for 2023 and two for 2024; see **Tables 6-11 to 6-14**, inclusive.

Median Activity Risk

- 6.4.107. In both 2023 and 2024, the overall risk calculated for the median level of activity for common pipistrelle and soprano pipistrelle was low (**Tables 6-11 and 6-12**). This remained true across the nine detectors and throughout the seasons for both species.
- 6.4.108. In 2023, the overall risk calculated using the median level of activity for *Myotis* sp., *Nyctalus* sp. and brown long-eared bat was medium. The associated risk for brown long-eared bat was the greatest of all the species, activity around two detectors was of high risk, S3 and S5, and the remaining five detectors were of medium risk, and the associated risk was medium during all three seasons.
- 6.4.109. The risk associated with *Myotis* sp. was high at S1 and medium at S5 which related to a medium risk during the autumn, the remaining detector localities and seasons were of low risk. The risk associated with *Nyctalus* sp. was medium at four locations S1, S2, S5 and S6, as well as during the autumn, the remaining four locations and two seasons were of low risk.
- 6.4.110. In 2024, unlike 2023, the overall risks of *Myotis* sp. and *Nyctalus* sp. were low across all detector locations and during the two deployment seasons. Brown long-eared bat had a medium level of overall risk, with similarly high risk at S5 and medium risk during summer and autumn compared to 2023; the remaining eight localities were of medium risk.

Table 6-11: Median Activity Risk Assessment 2023

Species	Median Activity 2023												
	Overall	Detector									Season		
		1	2	3	4	5	6	7	8	9	Spring	Summer	Autumn
Myotis sp.	5	15	3	3	3	6	3	3	3		3	3	6
Nyctalus sp.	5	6	6	3	3	9	6	3	3	3	3	3	6

Species	Median Activity 2023												
	Overall	Detector									Season		
		1	2	3	4	5	6	7	8	9	Spring	Summer	Autumn
<i>Pipistrellus pipistrellus</i>	1	0	0	0	0	0	3	0	0	0	0	3	3
<i>Pipistrellus pygmaeus</i>	1	3	3	0	0	3	3	0	0	0	3	3	3
<i>Plecotus auritus</i>	11	9	9	15	6	15	12		12		6	9	12

Table 6-12: Median Activity Risk Assessment 2024

Species	Median Activity 2024												
	Overall	Detector									Season		
		1	2	3	4	5	6	7	8	9	Spring	Summer	Autumn
<i>Myotis sp.</i>	3	3	3	3	3	3	3	3	3	3	N/A	3	3
<i>Nyctalus sp.</i>	3	3	3	3	3	3	3	3	3	3	N/A	3	3
<i>Pipistrellus pipistrellus</i>	0	0	0	0	0	0	3	0	0	0	N/A	3	0
<i>Pipistrellus pygmaeus</i>	1	0	0	3	0	0	3	0	0	3	N/A	3	3
<i>Plecotus auritus</i>	10	9	9	9	9	15	9	12	9	9	N/A	12	9

Maximum Activity Risk

- 6.4.111. In both 2023 and 2024, the overall level of risk calculated for the maximum activity level of common pipistrelle and soprano pipistrelle was low, this was true across all detectors and throughout both seasons (**Tables 6-13 and 6-14**).
- 6.4.112. In 2023, the overall level of risk for the maximum activity recorded within the Proposed Development Site was high for *Myotis sp.*, *Nyctalus sp.* and brown long-eared bat, see **Table 6-13**. Brown long-eared bat activity was detected at seven locations, five of which had a high associated risk during the autumn.
- 6.4.113. The high risks associated with *Myotis sp.* and *Nyctalus sp.* were caused by activity at S1 during the autumn and S2 during the summer, respectively.
- 6.4.114. In 2024, the overall level of risk associated with the maximum level of activity was high for brown long-eared bat due to high-risk activity around S1, S5 and S7 during the summer and autumn. Medium overall risk was calculated for *Myotis sp.* and *Nyctalus sp.*, compared with high in 2023, caused by medium risk activity recorded at S1-S3, S5, S7 and S8 during the summer and autumn.

Table 6-13: Maximum Activity Risk Assessment 2023

Species	Maximum Activity 2023												
	Overall	Detector									Season		
		1	2	3	4	5	6	7	8	9	Spring	Summer	Autumn
Myotis sp.	15	15	6	3	6	6	6	3	6			3	15
Nyctalus sp.	15	9	15	9	9	9	12	3	9		6	15	12
Pipistrellus pipistrellus	3	3	3	3	3	3	3	0	3	3	0	3	3
Pipistrellus pygmaeus	3	3	3	3	3	3	3	0	3	0	3	3	3
Plecotus auritus	15	15	15	15	12	15	15		12		6	12	15

Table 6-14: Maximum Activity Risk Assessment 2024

Species	Maximum Activity 2024												
	Overall	Detector									Season		
		1	2	3	4	5	6	7	8	9	Spring	Summer	Autumn
Myotis sp.	9	9	6	6	3	6	3	6	6	3	N/A	9	6
Nyctalus sp.	12	6	6	12	12	9	12	9	9	9	N/A	12	9
Pipistrellus pipistrellus	3	3	3	3	3	3	3	3	3	3	N/A	3	3
Pipistrellus pygmaeus	3	3	3	3	3	3	3	3	3	3	N/A	3	3
Plecotus auritus	15	15	12	12	9	15	9	15	12	12	N/A	15	15

Roosting and Foraging Potential

- 6.4.115. The desk study found that ten species of bat have been recorded within proximity to the Proposed Development.
- 6.4.116. These were soprano pipistrelle (55 records), common pipistrelle (51 records), Leisler's bat (42 records), Natterer's bat (32 records), Daubenton's bat (26 records), noctule bat (21 records), whiskered/Brandt's bat (19 records), brown long-eared bat (19 records), Nathusius' pipistrelle (three records) and whiskered bat (one record).
- 6.4.117. There were a further 51 records of *Pipistrellus* bats, 28 records of *Myotis* bats and six records of *Nyctalus* bats, not identified to species level, with an additional two records of unidentified bats not ascribed to any genus.
- 6.4.118. Four potential bat roost sites were found, all lying within the Proposed Development Site Boundary. Three were assessed as having moderate bat roost potential and were located at NX 67641 61256 (several old oak trees), at NX 67708 61118 (old ash tree) and at NX 67726 61061 (old ash tree).
- 6.4.119. An old dead oak tree was assessed as having high bat roost potential located at NX 67369 60315 on the edge of the Proposed Development Boundary. Furthermore, the Proposed Development is bordered on its northern and western edges by mature plantation which has potential to contain further bat roosts not identified during the survey. These trees will be outwith the works area by at least 30 m.
- 6.4.120. The combination of watercourses and ditches crossing the Proposed Development allow for bat foraging opportunities, as does the large waterbody of Loch Mannoch, and the Proposed Development is connected to the wider landscape by both watercourses and mature hedges.
- 6.4.121. The wider landscape surrounding the Proposed Development contains large areas of mature plantation (to the north and west) and to the southeast, mature broadleaf woodland, with further potential for bat roosts. Please refer to **TA 6-3 Bat Surveys** in **Volume 3** of the **2025** EIA Report for information on the results of the bat survey.
- 6.4.122. *In the context of the rarity and sensitivity of different bat species and species groups when viewed against the data in Tables 6-10 -6-14 the following valuations are considered appropriate:*
- *Myotis* - Local
 - *Nyctalus* - Regional
 - *Pipistrellus pipistrellus* - Local
 - *Pipistrellus pygmaeus* – Local
 - *Plecotus auritus* – Local

Protected Species Surveys (non-volant)

Amphibians/Reptiles

- 6.4.123. A search of SWSEIC records showed two records of adder within proximity of the Proposed Development although not within it. Common toad and common frog both had a similarly relatively low number of records (seven each) within proximity (but outside) the Proposed Development.
- 6.4.124. Additionally, there were three records of great crested newt, and eleven records of common lizard, all within proximity but outside the Proposed Development.
- 6.4.125. Inspection of aerial mapping of the area 250 m – 500 m from proposed infrastructure identified five bodies of water which were potentially suitable for great crested newt. It was confirmed via habitat suitability survey that four of the bodies of water scored below average in habitat suitability criteria for this species.
- 6.4.126. One pond, located at NGR NX 67607 60324 was considered to have good suitability for supporting a population of great crested newt.
- 6.4.127. However, the habitat between this pond and infrastructure is improved grassland with heavily eutrophied pond (which scored a below average HSI). Movement of great crested newt would be towards much more suitable terrestrial and aquatic habitat lies to the east, away from the Proposed Development. See **TA 6-4** in **Volume 4** of the **2025** EIA Report and **AI Figure 6-5** for further information.
- 6.4.128. No reptiles or amphibians were recorded during the protected species survey, although two potential reptile/amphibian hibernacula were noted, at NX 67592 61318 and at NX 67716 61087. Given the habitats on the Proposed Development, it is possible that reptiles and amphibians are present. These are considered to be Local value IEFs.

Otter and Water Vole

- 6.4.129. There were three records of otter within proximity to the Proposed Development noted in the SWSEIC records, and although their precise locations were unavailable it was noted that none of these records were within the Proposed Development Site Boundary. There were no records of water vole in the SWSEIC records.
- 6.4.130. Two signs of otter presence within the Proposed Development Site Boundary were recorded during the protected species survey; an otter spraint beside the Tarff Water at NX 67690 60689 and an otter print also beside the Tarff Water at NX 67704 60880, located on the far eastern boundary. No holt or other resting place was recorded. There were no signs of water vole recorded during the protected species survey and whilst some waterways are suitable, particularly the Tarff Water on the western boundary, others are narrow with little cover, so much less suitable. Otter and water vole are Local value IEFs.

Red Squirrel

- 6.4.131. The results of the desk study showed that the wider area had a significant number of records of red squirrel, 68 within the last ten years. Most of these records were from Laurieston Forest to the north of the Proposed Development, and there were no records in the SWSEIC data from within the Proposed Development Site Boundary.
- 6.4.132. Two squirrel dreys were noted during the protected species survey, at NX 66960 61598 and at NX 667028 61596, both in a small area of plantation forestry in the centre of the Solar Development. This plantation does not comprise part of the Proposed Development but is enclosed by it and the dreys lie outwith 50 m of proposed works areas.

6.4.133. There is little forestry directly within the Proposed Development Boundary and that which is excluded from the Proposed Development Boundary (**Figure 6-3** in **Volume 4** of the **2025** EIA Report). As such, the risk of direct loss of trees used by red squirrel is minimal. Red squirrel is a Local value IEF.

6.4.134. **Pine Marten**

6.4.135. *Four scats were found along the existing access track. As the species is likely to be present in the wider locality, and because tracks form a natural boundary on which pine martin will be predisposed to scat upon, the concentration of scats does not necessarily mean dens are in the immediate vicinity (i.e. within 100 m), though it is possible. Pine marten is a Local value IEF.*

Badger

6.4.136. Five setts were found and there were nine records of badger noted in the desk study within the proximity of the Proposed Development. All setts are beyond 30 m from proposed works areas.

6.4.137. Information on badger is regarded as confidential and therefore included in **Confidential TA 6-6** in **Volume 5** of the **2025** EIA Report.

6.4.138. Considering the number of reported badger sightings, this species will require consideration in this EIA Report as there is a high chance the area of the Proposed Development is used by badgers for foraging. Badger is a Local value IEF.

Fish

6.4.139. *The three main watercourses on the Proposed Development Site (Tarff Water, Anstool Burn and Glengap Burn) all have good to high potential habitat for salmonid species with the potential for spawning locations. The observations of fish in both the Glengap and Anstool Burns indicate that fish use the watercourses for breeding. Furthermore, the lack of major barriers in the three of these burns allows for sufficient fish migration up into the Site. The variations in river morphology throughout the water courses provides areas for multiple stages in the salmonid lifecycle. Atlantic salmon, sea / brown trout, European eel and lamprey, are considered as County value IEFs.*

Scoped out of the assessment

6.4.140. As stated above, all nature conservation designations are scoped out of further assessment based on the separation distance from the Proposed Development Site as well as the nature of the designated interest (none of the sites are designated for highly mobile species such as bats or fish).

6.4.141. Habitats not brought forward are excluded on the basis of either low ecological value (e.g. M25 Purple moor-grass grassland less than 50 cm deep and therefore not Priority Peatland) and/or distance from the potential Zol.

Bats (except *Nyctalus* spp.)

6.4.142. Common and soprano pipistrelle bats are scoped out of the assessment, because all nights of common pipistrelle and soprano pipistrelle activity were ranked as low with respect to the surrounding area and time of year in both 2023 and 2024. In addition, there was little activity within the emergence time ranges for each of the species throughout the Proposed Development Site.

6.4.143. *Myotis* spp. are scoped out of the assessment as the total amount of activity recorded in 2023 and 2024 (379 passes and 147 passes, respectively, spread across nine detector locations), indicates that the Proposed Development Site is not used regularly or abundantly by these species.

6.4.144. Whilst peaks of activity occurred occasionally at S1 in 2023 (**Figure 6-3** in **Volume 4** of the **2025** EIA Report), this level of activity was not replicated during 2024 surveys, and there were no nights of exceptional, high or moderate-high activity recorded during that year.

- 6.4.145. The two species most likely to be present (i.e. Daubenton's bat and Natterer's bat) are considered to be of low risk to impacts of wind farms at both the individual and population level (**Tables 6-3 and 6-4**) and are common and widespread throughout the UK (NatureScot, 2021) (Russ, 2012).
- 6.4.146. It is noted that populations of both these species in Scotland have been stable in the long-term (since 1999) and the short-term (since 2017) (Daubenton's) and since 2011 for Natterer's (BCT, 2024).
- 6.4.147. Brown long-eared bat was recorded with 97 passes in 2023 and 85 passes in 2024. When considering the activity in relation to the wider area, three nights of activity were considered exceptional in each year, around T5 and T6 in 2023 and S1 and S5 in 2024 (**Figure 6-3** in **Volume 4** of the **2025** EIA Report.), and a further 10 nights and 5 nights were considered high activity, respectively. These translated into a medium overall risk when considering the median level of activity and high risk when considering the maximum level.
- 6.4.148. Without context, the exceptional nights of activity and medium associated risk for the species appears to be of concern. However, taking into account the total amount of activity within the Proposed Development, fewer than 100 passes recorded across nine detector locations during multiple seasons of survey in each year, indicates that the habitat is not important for the species as it is not sufficiently present within the area. Furthermore, the species is considered to be at low risk of wind turbine collision, as seen in **Tables 6-3 and 6-4**, due to the nature of its flight, whereby brown long-eared bats would usually fly below the sweep of the turbines (Huston, 2022; NatureScot, 2021).
- 6.4.149. **TA 6-3** and **Figure 6-3** in **Volume 4** of the **2025** EIA Report should be viewed for further information and context in respect of bat species.
- 6.4.150. All bat roost potential trees will remain outwith the works area by at least 30 m. See **TA 6-4** in **Volume 3** of the **2025 EIA Report** and **AI Figure 6-5** in **Volume 4** of this **AI Report**.
- 6.4.151. In the context of the data received from surveys at the Proposed Development Site, plus the justifications above, Bats (except *Nyctalus* spp.) are considered Local value IEFs.

Great crested Newt

- 6.4.152. One pond was recorded as having a score of 'Good' from Habitat Suitability Surveys, it is located c.280 m south of the nearest infrastructure at its closest, which are solar panels.
- 6.4.153. Whilst 500 m is stated in NatureScot guidance (2024) as the distance when further survey is required (which has been interpreted as surveys additional to the Habitat Suitability Index i.e. eDNA, Population Class Assessment)), this is on the basis of potential newt habitat, but there is none between the pond and infrastructure, as it comprises improved grassland.
- 6.4.154. Natural England (2001) notes that 500 m applies on *sites with refuges (such as piles of logs or rubble), grassland, scrub, woodland or hedgerows* (p.21) and consistently refers to 250 m as a threshold in terms of suitable habitat and barriers to dispersal. On this basis great crested newt is scoped out of the assessment. It is considered a County value IEF.

Ancient Woodland

- 6.4.155. The single area of Ancient Woodland within the Zol of the Proposed Development (which is considered to be either within or adjacent to it) as identified in **Table 6-5** and on **Figure 6-2** in **Volume 4** of the **2025** EIA Report is scoped out on the basis of there being no direct loss of the habitat and adequate Root Protection Areas being in place (see section 6.6.2). Root Protection Areas as per BSI (2012) will be in place around the woodland.
- 6.4.156. It is considered a County value IEF.

6.5 Assessment of Effects

Future Baseline

- 6.5.1. The Proposed Development Site is likely to currently support species at or near to carrying capacity, with historical management practices and deer/livestock pressures having facilitated what appears to be the degrading condition of much of the habitat found within the upper slopes of the study area.
- 6.5.2. This means that a net increase in species population numbers would not be expected, should the Proposed Development not go ahead, and a continued depletion of the habitats on the upper slopes through dewatering processes and the erosion/desiccation of areas of exposed peat leading to further reduction in the quality of the mire.
- 6.5.3. Other changes over time may occur as a result of climatic change; these are difficult to predict but are likely to involve increased precipitation and gradual increases in average temperatures. Some change in the vegetation assemblage is likely to occur as a result of these changes.

Ecological Features Brought Forward for Assessment

- 6.5.4. Important Ecological Features (IEFs) are those that are important at a Local or higher level. The following applies to all non-avian IEFs brought forward to the detailed ecological impact assessment stage: They are potentially vulnerable to significant impacts from the Proposed Development.
- 6.5.5. However, it should be noted that mitigation is proposed to reduce the risk of legal offences occurring on individuals of protected species, even if the species is not an IEF in the assessment.
- 6.5.6. IEFs include the following, which are described further below:

Habitats

- 6.5.7. The habitat IEFs presented in **Table 6-15** are taken forward for assessment based on direct and indirect loss from the Proposed Development.

Table 6-15: Habitats Taken Forward for Assessment based on Potential Impacts and Conservation Value

NVC Code	Annex I	SBL Habitats	Priority Peatlands	Other
M15	-	Blanket bog	On 50 cm or more	
M15	H4010 (Wet heathland with cross-leaved heath)	Upland heathland	No	
M17	H7130 Blanket bogs	Blanket bog	Yes	
M18	H7110 Active raised bogs	N/A	Yes	
M25	-	Blanket bog	On 50 cm or more	
<i>W17d</i>				<i>native broad-leaved woodland is rare on the Proposed Development Site</i>

- 6.5.8. M15 and M25 are considered of Local value in EIA terms, based on their conservation significance and balanced against their ubiquity in the upland Scottish setting.
- 6.5.9. M17 and M18 are considered of County value in EIA terms, given their importance under NatureScot (2023) guidance for Priority Peatlands which are likely to be of National significance.
- 6.5.10. *W17d is considered as a Local value IEF on the basis that its importance is primarily confined to the Proposed Development Site itself or its immediate surroundings.*

- 6.5.11. **Table 6-16** shows the areas of habitats recorded within the Proposed Development Site which will be lost to construction and the relative proportions of each habitat lost against the total area of that habitat recorded within the Proposed Development Site. Habitats where there is no loss have not been included.
- 6.5.12. Temporary habitat loss has been classified as permanent loss where it occurs in areas of priority peatland. This is due to the sensitive nature of Peatland habitats and the potentially long regeneration periods that would be required for full restoration of these habitats in the event of any damage or degradation.
- 6.5.13. There may be minor discrepancies between totals due to rounding. Figures are to two decimal places.

Table 6-16: Predicted Loss of IEF Habitats Associated with the Proposed Development

Habitat Type NVC	Total Habitat in Proposed Development Site (ha)	Total Permanent Loss (ha)	Total Temporary Loss (ha)	Total Indirect Loss (ha)	Total loss (Permanent, Temporary and Indirect (ha)	Total Loss (Permanent, Temporary and Indirect (%)
Priority Peatland Habitats						
M15b <i>Trichophorum germanicum</i> – <i>Erica tetralix</i> wet heath on peat ≥ 50 cm	14.54	0.6	0.17	0.65	1.42	9.82%
M25 <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire on peat ≥ 50 cm	9.04	0.17	-	0.28	0.45	6.57%
M25a <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire <i>Erica tetralix</i> sub-community on peat ≥ 50 cm	89.48	2.39	0.84-	4.29	7.52	8.4%
Other NVC Habitats						
M15b <i>Trichophorum germanicum</i> – <i>Erica tetralix</i> wet heath on peat < 50 cm	13.39	1.19	0.21	1.57	2.97	22.16%
W17d <i>Quercus petraea</i> - <i>Betula pubescens</i> - <i>Dicranum majus</i> woodland	2.15	0.13	-	0.84	0.85	39.57%

Fauna

- 6.5.14. The following species are brought forward for assessment:
- 6.5.15. *Nyctalus* spp. (Leisler's bat and/or noctule bat) are Regional value IEFs and assessed at the genus level as data analysis did not separate to species due to the inherent difficulty in doing so.
- 6.5.16. Otter, badger, **pine marten** and red squirrel are regarded as Local IEFs given the survey results and their widespread distribution in Dumfries and Galloway.
- 6.5.17. *Based on liaison between Atmos Consulting and Galloway Fisheries Trust, the GFT response to the EIA (Table 6-1) and results of the FHS, Atlantic salmon, sea / brown trout, European eel and lamprey species have the potential to be present. As they share the majority of potential impact pathways (i.e. pollution, disturbance of riverbed substrates), they are regarded as an assemblage in terms of the potential significance of effects. This assemblage is regarded of County value.*
- 6.5.18. Although not observed during surveys, reptiles and amphibians are also brought forward for assessment on the basis of suitable likely habitat and likelihood of presence. The species considered likely are adder, common lizard, common frog and common toad. They are considered Local value IEFs.

6.6 Mitigation

- 6.6.1. In line with the CIEEM guidelines, the impact assessment in this chapter is carried out assuming that standard mitigation measures will be implemented.
- 6.6.2. The mitigation measures and good practice measures in the sections below will be applied to the Proposed Development during construction and operation.

Design Mitigation

- 6.6.3. Embedded mitigation relates primarily to the design evolution of the Proposed Development and implementation of proposed management practices intended from the start of construction.
- 6.6.4. Detailed information on infrastructure layout and design evolution is shown in the Design & Access Statement, and **AI Chapter 3: Description of the Development**, however, elements specific to terrestrial ecological and environmental protection are summarised here.
- 6.6.5. The design has evolved iteratively to minimise the impacts on potential GWDTEs and peat habitats through taking account of NVC results and hydrological assessments, in addition to the presence of watercourses. Much of this was done early in the design phase, although the detailed hydrological assessment subsequently determined that no GWDTEs are present (see Chapter 8: Hydrology, Geology and Hydrogeology for further information).
- 6.6.6. The Proposed Development has been designed to minimise works in the vicinity of mapped watercourses and to minimise the need for new water crossings to reduce the risk of pollution and changes to watercourse morphology. Eight watercourse crossings are proposed.
- 6.6.7. Guidance issued by Natural England (2014) and NatureScot (2021) provides a methodology for determining the minimum buffer distance required between a linear feature of potential value for bats and a wind turbine. In line with the guidance, design of the wind farm has ensured that a minimum stand-off buffer of 50 m will be maintained between the rotor-swept area and the nearest linear feature, which is considered to be conifer plantation tree-lines bordering the Proposed Development Site. On the basis of current dimensions of 98.5 m to hub height and up to 180 m tip (79.7 m blade length, excluding nacelle length) the calculation for the recommended minimum 50m buffer from blade tips calculates the distance required using the formula:
- Buffer distance from edge/feature = $\sqrt{(50\text{m} + \text{bl})^2 - (\text{hh} - \text{fh})^2}$;
- Where “bl” = blade length, “hh” = the hub height and “fh” = feature height. For woodland up to 10 m this corresponds to a minimum buffer of 97 m between turbine towers and the nearest woodland/edge feature; and
 - In considering the height of trees at the end of the operational period (40 years hence) using information on Sitka growth from Forestry Commission’s Forest Yield software it is considered trees will be c.32 (Matthews et al. 2016). On this basis a minimum buffer of 113m between turbine towers and the nearest woodland/edge feature will be required.
- 6.6.8. All turbine locations are beyond 113 m from the nearest woodland/edge feature.

Pre-Construction Phase

- 6.6.9. A pre-construction survey will be undertaken within 4 weeks of the start of construction, covering suitable habitat within 200 m from construction areas. This buffer accounts for potential otter presence as well as all other possible protected species interests. The survey will be undertaken by a suitably qualified ecologist and the results will inform whether the CEMP will include further mitigation, if required.

- 6.6.10. Should the presence of a protected species be found in an area where disturbance or destruction of breeding structures, cannot be avoided, a protected species licence may be required.
- 6.6.11. Root Protection Areas as per BSI (2012) will be in place around all woodland blocks both within and immediately adjacent the Proposed Development Site boundary.
- 6.6.12. A Pollution Risk assessment will be carried out identifying materials, areas and activities of greatest risk and laying out controls on these. From this a Pollution Prevention Plan (PPP) will be prepared. The PPP will form part of the CEMP. A PPP will also be in place during the operation and decommissioning phases of the Proposed Development.
- 6.6.13. The Proposed Development will be constructed in cognisance of the following guidelines:
- 'Control of water pollution from construction sites – Guidance for consultants and contractors' (Masters-Williams *et al.* 2001); and
 - 'Control of water pollution from linear construction projects' (Murnane *et al.* 2006).
- 6.6.14. *One year of pre-construction water quality sampling, as recommended by GFT and the Marine Directorate, would be undertaken. Water quality sampling would be repeated annually throughout the construction phase as part of a Fish Monitoring Plan. This will be an iterative document with established feedback mechanisms administered via a Steering Group of concerned stakeholders to implement further mitigation, if further mitigation is considered to be required.*
- 6.6.15. *Surveys would also be repeated in the operational phase, as post-construction monitoring, to establish that no potential impacts arise following completion of the works.*
- 6.6.16. *The FHS identified potential water quality monitoring points upstream and downstream of infrastructure and where accessible to future electrofishing. These are outline and may be refined.*
- 6.6.17. *Electrofishing should be undertaken pre-construction throughout the water courses to understand the population densities of fish species and different fish lifecycle stages in order to get a baseline before construction starts. This will form part of the Fish Monitoring Plan. This would be repeated during the construction period once every 12 months, then once in the operational period.*
- 6.6.18. The drainage design will comply with General Binding Rules (GBR's) 10, 11 and 21 for the track drainage, under the Water Environment (Controlled Activities) (Scotland) Regulations (CAR) 2011 (as amended) (SEPA, 2023).

Construction Phase

- 6.6.19. Outline details of construction mitigation measures will be provided in **TA 11-2 Outline CEMP** to be agreed with Dumfries and Galloway Council, in consultation with relevant stakeholders, post-consent but prior to development commencing. The CEMP will include the PPP, which will detail proposed surface drainage measures to treat and deal with surface runoff from the Site, will be designed in accordance with sustainable drainage systems (SuDS) principles.
- 6.6.20. Measures in the CEMP will also include details of the following:

General

- Works to be overseen by an Environmental Clerk of Works (EnvCoW) and their role and responsibilities. In outline, this role will include ongoing monitoring of environmental / ecological constraints, review and audit of the appointed contractor's environmental performance, delivery of toolbox talks, and supervision of construction works;

- There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows, as directed by the EnvCoW to avoid erosion or siltation of existing watercourses in the process;
- *Double silt fences would be installed around the watercourses flowing into Loch Mannoch to prevent sediment/silt infiltration ingress;*
- Silt fencing will be placed at the Proposed Development boundary edge where watercourses occur within 50 m of the boundary;
- Drainage measures, including drainage ditches and silt traps, will be provided to collect and treat increased surface run off;
- Infiltration interception drains for upslope 'clean' water collection and dispersion;
- Flow attenuation and filtration check dams will be installed, where appropriate, to reduce velocities, with consideration given to gradient with drains to determine spacing requirements;
- Silt fences, straw bales and biodegradable matting will be used to control surface water runoff for deposition areas;
- Deposition areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in runoff;
- *Works for stream crossings would be carried out during July to September to avoid the vulnerable period for juvenile salmonids (spawn to parr) that may be present in downstream environments outside of this window;*
- *Any works would be suspended during high rainfall events to minimise creation of sediment laden surface runoff and weather forecast information would be utilised to plan the timing of excavation works;*
- *There would be no crossing of rivers or streams by machinery during the construction phase, other than by constructed access routes, and all machinery would remain within the works corridor and utilise designated access routes;*
- *Concrete and cement mixing and washing areas would be sited at appropriate distances (using appropriate buffers as advised by the EnvCoW and SEPA) from any surface watercourses to limit potential pollution of the water environment;*
- *Site drainage measures, including drainage ditches and silt traps, would be provided to collect and treat increased surface run off;*
- *Cement leachate, hydrocarbon oils and other toxic poisonous materials would require full containment and would not be permitted to discharge to any waters;*
- *Wash out areas for concrete batching plant as well as the use of ready mixed concrete lorries should be located as far as practically possible from watercourses to provide a hydrological buffer onsite;*
- *No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse would be permitted;*
- Appropriate bunded storage will be in place for storage of fuels/oils, with onsite storage of hydrocarbons to be kept to a minimum;
- Wastewater emanating on-site (sewage, wastewater from site office) will be taken off-Site for disposal/treatment at controlled facilities. To this effect, welfare facilities for construction site workers will include self-contained port-a-loos with an integrated waste holding tank;

- *There would be an emergency plan for the construction phase to deal with accidental spillages included in the CEMP; and*
- Wind turbines and associated infrastructure including tracks and other hardstandings will have a micro siting allowance of up to a radius of 50 m.

6.6.21. A detailed CEMP will be produced post consent and agreed with D&G Council prior to construction starting.

Habitats

6.6.22. The loss of plant communities is an unavoidable consequence of the Proposed Development. However, incidental habitat loss will be avoided by minimising the footprint of construction activities. This will be achieved by:

- Operating machinery and storing materials within the footprint of permanent construction features wherever practicable; and
- By ensuring that vehicles and their operators do not inadvertently stray onto adjacent habitat areas.

6.6.23. Other habitat-related measures within the CEMP include the following:

- Re-instatement of habitats – best practice techniques for vegetation and habitat re-instatement will be adopted and implemented on areas subject to disturbance, such as the temporary construction compound area, as soon as is practicable;
- Materials and other temporary infrastructure will be removed off-site and all temporary construction areas will be reinstated;
- The surface layer of soil and vegetation will be stripped separately from the lower soil layers, stored separately, and replaced as intact as possible once the construction phase is complete. Turf material will be replaced as far as possible in similar locations to where it was removed;
- Soils removed from the excavated area will be stored separately in piles, no greater than 3 m in height, directly adjacent to, or near the tracks on ground appropriate for storage of materials, i.e. relatively dry and flat ground, a minimum of 50 m away from watercourses (where possible). Wherever possible, reinstatement of ground disturbed to facilitate construction of the track will be carried out as track;
- No refuelling will be permitted at works locations within the 50 m of watercourses (where possible);
- Impermeable barriers and/or clay plugs will be used to avoid the trenches acting as preferential conduits of groundwater; and
- Areas of identified sensitivity (peatlands) will be marked out / fenced-off to prevent accidental vehicular access.

6.6.24. **Fauna**

- As there is potential for fauna to access the Proposed Development Site excavations/holes will be covered at the end of each working day, or a wooden plank placed inside to allow faunal species to escape, should they enter the hole. Any temporarily exposed open pipe system would be capped in such a way as to prevent wildlife gaining access;
- No in-channel obstructions (floodlighting, fencing or diversions) will be permitted within watercourses unless specifically authorised in writing by the relevant authority (i.e., SEPA and/or a suitably experienced freshwater ecologist employed by the Principal contractor);

- In the event that a protected species is discovered all work in that area would stop immediately and the EnvCoW would be contacted. Increased buffer areas may be required in these locations;
- A toolbox talk highlighting the presence of protected species should be given to all staff during their induction;
- The pre-construction survey will confirm if measures such as 'badger gates' are required within works fencing to ensure safe access to badger setts and the wider area for foraging;
- No new ground will be cleared without prior inspection by the EnvCoW to ensure reptiles, should they be present, are encouraged to disperse before clearance. Clearance will occur in a manner to ensure dispersal routes for reptiles;
- A speed limit of 15 mph will be in place at all times to reduce the risk of collision and protected species mortality associated with construction vehicles;
- Measures shall be implemented to reduce the potential for even non-significant construction impacts to bats, e.g., downward-directed artificial lighting will be used to shine light to the working area only and reduce 'light leakage' that may temporarily affect bat flightlines; and
- The following measures will be incorporated into a sensitive lighting regime if construction lighting is to be used, in respect of bats:
 - Lighting columns that are set back from treelines;
 - Use of warm white LEDs (lights should peak higher than 550 nm);
 - Lights with a 0% upward spill ratio (no vertical light spill);
 - Light should be kept near to or below the horizontal;
 - Waterbodies or watercourses will not be directly illuminated; and
 - Use of warm white LEDs (lights should peak higher than 550 nm).

Operational Phase

6.6.25. During the operational phase the following mitigation and compensation will be in place.

Habitats

- 6.6.26. **Table 6-17** shows priority peatland loss compared against intended restoration. A principal aim of restoration will be to restore all peatlands towards M17. M25 is typically a degraded form of bog which, with the right interventions, can be restored to M17. M17 is typically wetter, holds deeper peat and a higher diversity of mosses and floral species.
- 6.6.27. Erosion features including artificial drains and areas for bog improvement have been identified as shown on **Figure 6-8** in **Volume 4** of the **2025** EIA Report and form the basis of compensation and enhancement calculations within unimpacted priority peatland and peaty soil habitats which remain following infrastructure installation.
- 6.6.28. It is noted that the priority peatland loss accounts for 9.39 ha. On a x10 basis 93.9 ha is therefore required as compensation under NatureScot (2023) guidance. For enhancement, an additional 10% of potential National interest Priority Peatlands is required, which amounts to 0.12 ha based on the 1.02 ha of these types within the Proposed Development Site.
- 6.6.29. As such, 95.1 ha is required in total under guidance and 88 ha has been identified under the current restoration plan.

- 6.6.30. This is less than the target in the guidance as several areas containing cultural heritage assets have been removed from earlier restoration proposals. It is, however, considered a significant enhancement given the 1/9.25 loss/compensation ratio in the context that the guidance defines Priority peatlands as peatlands which show 'evidence of being undisturbed and actively forming peat.'
- 6.6.31. In addition, in line with the principles of the Fourth National Planning Framework (NPF4) which sets out requirements for developments to deliver positive effects and conserve, restore and enhance biodiversity under Policy 3 (Scottish Government, 2023), an extensive range of planting types have been included on the lowland Solar Development, as included in the Outline HMP (TA 6-6).
- 6.6.32. The EnvCoW will monitor the condition of restored peat and watercourses. Details of the reinstatement and monitoring programme are included in the HMP (TA 6-6). Quadrats will be established in year 1 following the start of restoration with surveys carried out in year 3 and 5. Further surveys will be carried out in years 7, 10, 15 and 40.
- 6.6.33. The proposed access tracks will be left in place after completion of the construction phase as they will provide access for maintenance, repairs, and the eventual decommissioning phase.
- 6.6.34. Hardstanding areas at each turbine location will be retained for use in on-going maintenance operations, with the edges as far as possible blended to the adjacent contours with natural vegetation being allowed to re-establish.

Fauna

- 6.6.35. A site speed limit of 15 mph will be always in place to reduce the risk of faunal collisions with vehicles, as detailed in the CEMP.
- 6.6.36. The following measures will be incorporated into a sensitive lighting regime if operational lighting is to be used, in respect of bats, lighting will only be turned on when staff are present and will have the following characteristics:
- Use of warm white LEDs (lights should peak higher than 550 nm);
 - Lights with a 0% upward spill ratio (no vertical light spill);
 - Light should be kept near to or below the horizontal;
 - Waterbodies or watercourses will not be directly illuminated; and
 - Use of warm white LEDs (lights should peak higher than 550 nm).

6.7 Identification and Evaluation of Effects

- 6.7.1. The three phases of the project lifecycle are considered separately as different effects will occur over the project lifetime.

Construction Effects

- 6.7.2. During construction it is anticipated that, in the absence of further mitigation to that described above, likely sources of direct and secondary effects may arise from:
- Habitat loss or damage (permanent and temporary) due to construction of wind farm infrastructure;
 - Sedimentation or other pollution of watercourses from construction activities and vehicular traffic;
 - Secondary effects on sensitive habitats through siltation/pollution/spread of invasive species;

- Inadvertent killing, injuring or disturbance of fauna during construction; and
- Disturbance to fauna due to vehicular traffic, operating plant, and the presence of construction workers.

Habitats

- 6.7.3. **AI Chapter 3: Description of the Development** in **Volume 2** of this AI includes proposed dimensions of all turbines, turbine foundations, crane hard-standings, access tracks, substation, borrow pits, control building and construction compounds. The impacts are categorised as follows:
- Permanent habitat loss: this includes habitats present under the footprint of the Proposed Development, including tracks, turbine bases, substation, compounds, and drains;
 - Temporary habitat loss: relating to infrastructure in use only during the construction phase, i.e. temporary scaffolds, storage of construction materials; which may cause damage or loss of habitat but is likely to regenerate after the construction phase has finished; and

6.7.4. Indirect habitat disturbance: where temporary infrastructure is proposed and in relation drying out effects on habitat adjacent to that directly lost, based on 10 m distance from direct loss.

6.7.5. These potential impacts are addressed for each IEF brought forward to assessment.

6.7.6. **Table 6-16** above indicates the potential temporary and permanent habitat loss associated with the infrastructure and habitats brought forward for assessment. Loss calculations include a 10 m buffer of infrastructure land-take to account for indirect, drying effects.

M15b *Trichophorum germanicum* – *Erica tetralix* wet heath on peat ≥ 50 cm

6.7.7. This habitat is of **Local** value and aligns with the SBL habitat, 'Blanket Bog' when on peat 50 cm depth or more.

6.7.8. There will be loss of 1.42 ha; 0.6 ha of which will be permanent loss. The combined loss equates to 9.82% of the 14.54 ha recorded within the Proposed Development Site. Given the proposed restoration of 88 ha of peatland, a **minor temporary adverse effect** on a Local IEF applies in the short term, which is **not significant** in EIA terms.

M15b *Trichophorum germanicum* – *Erica tetralix* wet heath on peat < 50 cm

6.7.9. This habitat is of **Local** value. It aligns with the SBL habitat 'Upland Heathland' and also qualifies as an Annex I Habitat 'H4010 (Wet heathland with cross-leaved heath)' when on peat depths of less than 50cm.

6.7.10. There will be loss of 2.97 ha; 1.19 ha of which will be permanent loss. The combined loss equates to 22.16% of the 13.39 ha recorded within the Proposed Development Site, which is considered a **minor permanent adverse effect** on a Local IEF. As M15b is the typical M15 sub-community and is widespread in the region, the extent, structure and function, at the scale of the Proposed Development, is not likely to be affected to a level which is significant in EIA terms. In addition, habitat wetting measures intended for priority peatlands across the Proposed Development Site, plus reduction in M25 *Molinia* grassland (also intended as part of peat restoration) will aid development of the structure, function and extent of M15b over time. As such, effects on M15b <50 cm are not considered to be significant.

M17 *Trichophorum germanicum* - *Eriophorum vaginatum* blanket mire *Drosera rotundifolia* – *Sphagnum* spp. sub-community

6.7.11. This habitat is of **County** value and aligns with the SBL habitat 'Blanket bog'. It also qualifies as an Annex I Habitat 'H7130 (Blanket bogs)'.

- 6.7.12. There will be no direct or indirect loss of this habitat. As such, effects from the Proposed Development of this feature of County value are not considered to be significant in EIA terms.

M18 *Erica tetralix* – *Sphagnum papillosum* raised and blanket mire *Sphagnum magellanicum* – *Andromeda polifolia* sub-community

- 6.7.13. This habitat is of **County** significance which qualifies as an Annex I Habitat 'H7110 Active raised bogs).

- 6.7.14. There will be no loss to this habitat community and therefore no effect.

M25 *Molinia caerulea* – *Potentilla erecta* mire on peat ≥ 50 cm

- 6.7.15. This habitat is of **Local** value and aligns with the SBL habitat 'Blanket Bog' when on peat 50 cm depth or more.

- 6.7.16. There will be loss of 0.45 ha; 0.17 ha of which will be permanent loss. The combined loss equates to 6.5% of the 9.04 ha recorded within the Proposed Development Site, which is considered to be a **minor adverse (non-significant) effect** on a Local IEF in the short term.

M25a *Molinia caerulea* – *Potentilla erecta* mire, *Erica tetralix* sub-community on peat ≥ 50 cm

- 6.7.17. This habitat is of **Local** value and aligns with the SBL habitat, 'Blanket Bog' when on peat 50 cm depth or more. As such, not all M25a within the Proposed Development Site will meet this criterion. Peatland on the Proposed Development Site is degraded as evidenced by the ubiquity of this habitat and it is this habitat which forms the focus of peat restoration measures as described in the HMP.

- 6.7.18. This work will comprise drain blocking but also use of *Sphagnum* propagule placement, within *Molinia* swards. The HMP includes 88 ha of proposed restoration measures with the target habitat of M17 Blanket bog.

- 6.7.19. There will be loss of 7.52 ha, 2.39 ha of which will be permanent loss. The combined loss equates to 8.4 % of the 89.48 ha recorded within the Proposed Development Site. This is considered to be a **minor temporary adverse (non-significant) effect** on a Local IEF applies in the short term. This is not significant in EIA terms.

W17d *Quercus petraea*-*Betula pubescens*-*Dicranum majus* woodland

- 6.7.20. *The loss of 2.15 ha of W17d Quercus petraea-Betula pubescens-Dicranum majus woodland amounts to 39.57 % of the total resource within the Proposed Development Site upon a Local value IEF. Given the small localised nature, this loss is considered a minor adverse effect on the habitat in the locality. This is not considered to be significant.*

Fauna

***Nyctalus* spp.**

- 6.7.21. Since there were no roosts recorded within the Proposed Development Site, it is unlikely that bats will be negatively affected by habitat loss during the construction phase.

- 6.7.22. The land subject to the development of infrastructure, which consists predominantly of open moorland, is of low value to bat species for foraging; the surrounding forestry which is more suitable habitat generally, will be unaffected during the construction phase.

- 6.7.23. It is also noted that no direct loss of trees or foraging habitat features (tree-lines, hedgerows watercourses) will occur and that the high-flying nature of these species will mean that most flights are likely to be above the construction zone. It is acknowledged, however, that the increase of activity

on what is a remote site may have localised effects from works activity occurring just prior to dusk, and for this reason a **minor adverse effect** is considered likely on this **Regional** value IEF, which is **not significant in EIA terms**.

Otter

- 6.7.24. Otter is known to be using the Tarff water in the far east based on two signs found during surveys (one print and one spraint only). As otters are present in most of Scotland's watersheds, it is not unexpected that otters should be using this watercourse, although the evidence suggests a permanent presence is unlikely.
- 6.7.25. Otters are likely to be moving through using the watercourse as a commuting/foraging route. As there will be no direct loss of riparian vegetation, potential effects would likely be restricted to disturbance impacts, but considering the low level of activity and absence of resting places recorded during surveys, no more than a **minor adverse effect** is considered likely on this **Local** value IEF, which is **not significant** in EIA terms.
- 6.7.26. It is noted that a pre-construction survey will be undertaken within four weeks of the start of construction covering suitable habitat within 200 m from construction areas. Should a resting place be found works will be halted and an appropriate buffer (as directed by the EnvCoW) implemented.
- 6.7.27. The buffer will work within the 50 m micro-siting allowance, or in the case of a breeding holt, a derogation licence with Species Protection Plan from NatureScot may be required.

Badger

- 6.7.28. Four setts were found, the locations of which are not included here for reasons of confidentiality (see **Volume 5, TA 6-6**). A 50 m buffer will be maintained between these locations during works which will include boundary fencing.
- 6.7.29. Safe foraging access will be maintained to and from sett locations to the wider, area with badger gates within fencing if required - assuming setts are confirmed as active during the pre-construction survey. On this basis, a **negligible effect** is predicted for this **Local** IEF. This is not significant in EIA terms.

Red Squirrel

- 6.7.30. The Solar Development infrastructure has been moved to remain outwith 50 m from the two active red squirrel dreys identified in the east of the Proposed Development Site. Whilst this distance is required around confirmed breeding dreys only, and breeding has not been confirmed, the buffer has been added as a precaution. On this basis, a **negligible effect** is predicted for this **Local** IEF. This is not significant in EIA terms.

Pine Marten

- 6.7.31. *Up to 100 m either side of the Western access track was surveyed although complete access was not possible due to dense nature of the primarily mature conifer plantation (some broad-leaved trees were also present). Whilst it cannot therefore be concluded that resting places are absent, this is countered by the fact that a pre-construction survey will be conducted within four weeks before construction and on implementation of the micro-siting allowance. As this allowance is 50 m, there is a disparity between the 100 m disturbance buffer required for breeding resting places found within the March-June inclusive period as described in guidance (NatureScot, 2024). Should confirmed breeding dens be found within 50 m where land can be safely accessed at construction, then the route would be micro-sited to avoid these potential resting places wherever possible. If this is not possible or should confirmed breeding dens be found between 50 m and 100 m, works would cease until an appropriate derogation licence had been obtained from NatureScot. For non-breeding dens*

*the minimum distance required will be 30 m. On the basis of this approach, and that works are generally confined to the existing track, no more than a **negligible effect** is likely on this **Local IEF**. This is not significant in EIA terms.*

Reptiles

- 6.7.32. Whilst no reptile species were seen during surveys, species such as common lizard are likely to be present. As a precaution, the two hibernacula will not be removed during works and habitat will be retained to ensure adequate escape by reptiles from them, should they be present. In addition, vegetation in the vicinity of the hibernacula will be trimmed at an appropriate time and kept low to deter lizards from using it.
- 6.7.33. The EnvCoW will check them before works occur ensuring no disturbance, particularly during the hibernation period (October to early May). A suitable receptor area will be marked out for placing animals, should they be found. This work would be conducted by a Suitably Qualified Ecologist. On this basis, a **negligible effect** is considered likely on this **Local IEF**. This is not significant in EIA terms.

Fish

- 6.7.34. *The inclusion of Fish as an IEF has identified the three main watercourses on the Proposed Development Site to have good to high potential habitat for salmonid species with the potential for spawning locations. Discussion with GFT has flagged the possibility of European eel and lamprey spp. in the vicinity as well. This has necessitated the need to revise the pre-construction mitigation to include additional measures such as timing instream working to July – September, controlling the use of concrete and using double silt-fencing. With implementation of these measures, the likelihood of an incident leading to an adverse effect on this County value IEF at the population level is low and will not be significant.*
- 6.7.35. *The Applicant is keen to engage with GFT throughout the pre-construction and construction periods and seek ongoing involvement regarding advice for working within/adjacent watercourses, bridge and culvert construction. As a result of liaison between GFT and Atmos, on behalf of the Applicant, it has been agreed that an electrofishing survey will be carried out in the summer of 2026, to inform the future FMP. As a result, GFT have lifted their objection to the Proposed Development.*

Operational Effects

- 6.7.36. During operation it is anticipated that impacts may arise from:
- Death, injury to bats from collision with wind turbines and displacement of bats from commuting routes by presence of infrastructure;
 - Minor pollution events connected to machinery used for maintenance; and
 - Inadvertent killing, injuring or disturbance of fauna from the movement of operational plant.

Habitats

- 6.7.37. Habitats are grouped given the lower potential magnitude of effects applicable at the operational stage. Whilst effects from construction on hydrologically sensitive habitats may persist into operation, no new effects will be generated during the operational phase. Overall, **negligible effects** are considered likely. This is not significant in EIA terms.
- 6.7.38. Peat restoration, woodland, scrub and wildflower planting measures will have commenced by this time, which will deliver significant positive effects over the course of the operational life of the Proposed Development.

Fauna

Nyctalus spp.

- 6.7.39. The overall median risk for this group was medium in 2023 and low in 2024, whereas maximum risk across detectors was high in 2023 and medium in 2024 (See **Tables 6-11 to 6-14, Figure 6-6**).
- 6.7.40. As the overall median level of risk associated with the species was medium throughout the entire Proposed Development Site during 2023, whereas the maximum level of associated risk was high, specifically at S2 (turbine 7) during the summer, it is reasonable to assume there was a peak of activity recorded at this location during the summer of that year.
- 6.7.41. Although the spring survey was not carried out in 2024, as only 33% of calls from 2023 were recorded in 2024, 2023 is considered to include an atypical year with a peak at S2. There were no nights of exceptional or high activity in 2024. The peak at S2 in 2023 however does present a potential significant risk to this Regional value receptor. On this basis, a **moderate adverse effect** is considered likely on this Regional value IEF, which is **Significant**, in EIA terms.
- 6.7.42. As such, further mitigation is necessary, as described in section 6.8. *Following NatureScot comment on the suggested curtailment regime in the 2025 EIA Report, the proposed regime utilising a smart curtailment protocol reflective of time, month, temperature, wind speed and precipitation has been extended.*

Otter, Badger, Red squirrel, *Pine marten*, Reptiles and Fish

- 6.7.43. As activity will be limited to occasional routine maintenance, and on the basis that a 15mph speed limit will be in place, **negligible effects** are predicted for these ~~Local value~~ IEFs. This is not significant in EIA terms.

Decommissioning Effects

- 6.7.44. It is difficult to predict impacts which could arise from decommissioning and the confidence in all predictions is therefore less certain due to the length of the operational period (40 years), changes in habitat and species assemblage therein and changes in legal and policy requirements.
- 6.7.45. It is assumed, however, that impacts are likely to be similar in nature to the construction phase but of lower magnitude, because the infrastructure will be in place to enable access to the Proposed Development.
- 6.7.46. IEFs are grouped as the lower magnitude of possible effects does not require splitting habitats, and fauna, into separate types or species as set out in the construction phase.
- 6.7.47. Once the Proposed Development Site ceases operation after the period of generation, all major equipment and structures will be removed or may be replaced with a new set of turbines subject to planning permission being obtained.
- 6.7.48. Upon decommissioning of the Proposed Development, the wind turbines would be disassembled in reverse order to how they were erected. All above ground turbine components would be separated and removed off-site for recycling.
- 6.7.49. Tracks and crane hardstands will remain and be grassed over or reseeded. Underground cables will be de-energised and left in place. Turbine foundations will be buried, and the area will be reseeded.
- 6.7.50. It is estimated that this process will take up to 12 months.
- 6.7.51. A Decommissioning Plan will be prepared prior to any decommissioning, which will be agreed with DGC. The plan will provide details of the methodologies that will be adopted, the environmental

controls that will be implemented, the Emergency Response Procedure, methods for reviewing compliance and an indicative programme of decommissioning works.

Habitats

- 6.7.52. Removal of infrastructure may occur where habitat restoration has occurred, for example where cable ducting and turbine removal occurs. Should this be the case the work will be overseen by an EnvCoW.
- 6.7.53. As the principle of restoration assumes higher value habitats over time, and on a precautionary basis, it is assumed that the Local IEFS identified above will be Local-County IEFs given the 40-year interval between restoration and decommissioning.
- 6.7.54. As a result of EnvCoW guidance, as detailed in the HMP (TA 6-6 in **Volume 3** of the **2025** EIA Report), no more than a **minor adverse effect** is likely, which is not significant in EIA terms.

Fauna

- 6.7.55. **No significant effects** are considered likely on identified IEFs included in this chapter as works will be a significantly scaled down version of those associated with construction occurring at discrete locations and at specific times.
- 6.7.56. It is noted that a pre-works survey will be undertaken within four weeks of the start of works covering suitable habitat within 200 m from these areas.

Cumulative Effects

- 6.7.57. Cumulative effects can occur where impacts from one development, which may not be significant at the population level itself, when combined across many developments could result in a detrimental effect on a wider scale.
- 6.7.58. This could mean habitat loss, disturbance to species (for example of several wind farms adjacent to each other were to be in construction either simultaneously or consecutively) or impacts across connected receptors, such as watercourses which form part of one river system. Developments described below are shown on **Figure 1-4** in **Volume 4** of this EIA Report.

Wind Farm Developments

- 6.7.59. Several wind farm developments occur within 10 km, and these are listed in sequential order of proximity to the Proposed Development in **Table 6-17**. They include single turbine projects. The distances may over-estimate proximity as they relate to distance between the red line boundary of the Proposed Development to the edge of the listed site boundary but not necessarily to infrastructure locations within either development.

Table 6-17: Cumulative Wind Farm Developments within 10 km

Site Name	Planning Application Reference	Status	No. of Turbines	Tip Height	Distance from Proposed Development
Trostie Farm	11/E/2/0015	Approved	1	66.5 m	1.4 km
Chapel Cottage	Unknown	Operational	1	Unknown	4.1 km
Ingelston Farm	10/P/2/0491	Approved	2	45.5 m	7.1 km
Little Sypland	12/P/2/0296	Approved	1	74 m	7.5 km
Garrocher Farm	11/E/1/0089	Scoping	1	67 m	8 km
Mark Farm	14/E/1/0021 (10/P/1/0491)	Scoping	2 (11 in initial proposal)	78 m	8.1 km

- 6.7.60. None of the proposed or constructed wind farm developments within 10 km of the Site were deemed of significant scope to require a full Environmental Impact Assessment, or an assessment is not publicly available. It is therefore considered that there would be no potential for cumulative significant ecological effects due to the separation and limited scale of the pre-existing wind turbine developments or planned developments and of the Proposed Development.

Non-Wind Farm Developments

- 6.7.61. **High Nunton Farm – Solar Farm & Battery Storage (Application submitted)** – 7.6 km from Proposed Development Boundary, Planning application ref.: 21/2490/FUL
- 6.7.62. The EIA relating to this project has identified bats, badgers and several peatland habitats which are present in the development area as potentially sensitive receptors to the development. These receptors are also present in the Proposed Development.
- 6.7.63. The High Nunton Farm EIA rated the impact of that development on GWDTEs and Annex I habitats as not significant. This is because only very small sections of the Annex I communities surveyed such as fen-basin mire and fen valley mire with purple moor grass were due to be impacted at all by the development. This was also paired with restoration works which were recommended to improve the overall habitat quality on site.
- 6.7.64. The overall effects of this site on badger populations were deemed to be local, short-term and of low magnitude. A Species Protection Plan was put in place to mitigate any potential effects of the development on badgers.
- 6.7.65. The bat populations recorded at the site included *Nyctalus* spp. which are features observed on the Proposed Development Site that have been brought forward for assessment.
- 6.7.66. It was determined that that development would not significantly impact bat populations, as the more suitable bat habitats such as forestry are not affected by the infrastructure development.
- 6.7.67. **Barwhillantry House, Barwhillantry Estate – Solar Array (Permission granted)** – 9.8 km from Proposed Development Boundary, Planning application ref.: 23/1872/FUL
- 6.7.68. This development was considered to have too small a footprint to warrant the production of a full EIA Report.

Interactions with the Proposed Development

- 6.7.69. Based on the IEFs found in relation to the Proposed Development Site and based upon review of ecological reporting in respect of the above developments, where this information is available, the following broad IEF groups are considered.

Bats

- 6.7.70. The sites within 10 km of the Proposed Development are relatively small developments of either one or two turbine arrays. **As the base level of effects on bat species is already low; any negative effect from the Proposed Development, in EIA terms, is therefore unlikely to have a significant cumulative effect.**

Habitats

- 6.7.71. The land footprint and number of turbines in the development sites within the vicinity of the Proposed Development means there is little negative cumulative impacts on habitat from those projects.
- 6.7.72. As encountered at the Proposed Development Site, much of the blanket bog encountered at these projects is in a degraded state following historic grazing and burning. Across these projects (with the

predicted gains encompassed in these plans), is expected to see an overall improvement of blanket bog resource within and in the vicinity of the Proposed Development Site.

- 6.7.73. As the identified projects in the vicinity of the Proposed Development are much smaller, and because the Proposed development will comprise an overall benefit to peatland habitats, **there is not considered to be a significant cumulative adverse effect on priority peatlands from the Proposed Development.**

6.8 Additional Mitigation

Curtailment

- 6.8.1. In response to the discovery of high concentrations of *Nyctalus* bats (noctule and Leisler's bat) during the summer and autumn of 2023, the following regime will be put in place. This would be reviewed to determine the appropriate next steps (i.e. whether more or less mitigation is required).
- 6.8.2. Based upon academic research, bat activity is affected by two factors, wind speed above 5.99 m/s and temperature below 11°C (Collins, 2023) (Lintott & Mathews, 2018) (Mathews, Lintott, Richardson, & Hosken, 2019).
- 6.8.3. Analysis of the 2023 dataset identified that the species was significantly more active during the summer and autumn months, from 1st of June until 31st October, compared to the spring, 1st of April until 31st May. *However, the mitigation strategy has been revised in response to NatureScot's responses to the initial mitigation proposal (TA 6-3). Following further analysis (AI TA 6-7), the curtailment period at Turbine 7 has increased from 2 hours either side of sunset and sunrise to 5-6 hours after sunset and 1-2 hours before sunrise. This will be managed using a 'smart' curtailment system as recommended by NatureScot (2021).*
- 6.8.4. *Whilst we do not propose to expand curtailment beyond Turbine 7 at this time, we reiterate that the purpose of the 5-year Post Construction Monitoring programme is to be adaptive and that wider curtailment will therefore occur if fatalities warrant it. A bat death threshold would be implemented at each turbine, whereby curtailment will be implemented once three carcasses have been identified in the year.*
- 6.8.5. For operational reasons it may be necessary to amend the curtailment operating definition e.g. IT issues, equipment malfunction or other unforeseen circumstance. In such circumstance, the reasonable endeavours will be taken to ensure compliance with the spirit of the curtailment strategy to ensure the risk to bats is managed.

Post-Construction Monitoring

- 6.8.6. Post-construction monitoring is recommended for a minimum of the first five years of operation in order to adjust the mitigation strategy iteratively during years two to five; it is assumed that by year five an optimum level of avoidance will have been determined and would be perpetuated for the lifetime of the Proposed Development. *We note that NatureScot (2021) guidance requires three years minimum whereas the proposal is for a minimum of five years.*
- 6.8.7. These survey schedule would take place from 1st of June until 31st of October for the first five years of operation and will consist of the following:
- 6.8.8. Nightly recording of bat activity at each turbine location by static detectors, and
- 6.8.9. Monthly carcass searches around each turbine location.
- 6.8.10. **As a result of curtailment at turbine 7 (static location S2) within the conditions described, no residual effect is considered to remain as a result of the Proposed Development.**

6.9 Residual Effects

- 6.9.1. Following mitigation measures described in section 6.6, one significant effect will remain, namely a moderate adverse effect for *Nyctalus* species (Leisler's bats and/or Noctule bats) which are Regional value IEFs. As a result, a programme or target curtailment will be undertaken.

6.10 Conclusions

Table 6-18: Summary of Residual Effects of the Proposed Development

Receptor	Evaluation	Detailed assessment required	Construction	Operational	Decommissioning
Designated Sites					
Galloway Oakwoods SAC	International	No	N/A	N/A	N/A
Woodhall Loch SSSI	National	No	N/A	N/A	N/A
Carstramon Wood SSSI	National	No	N/A	N/A	N/A
Threave and Carlingwark Loch SSSI	National	No	N/A	N/A	N/A
Killiegowan Wood SSSI	National	No	N/A	N/A	N/A
River Dee (Parton to Crossmichael) SSSI	National	No	N/A	N/A	N/A
Ardwall Hill SSSI	National	No	N/A	N/A	N/A
Cairnsmore of Fleet SSSI; NNR	National	No	N/A	N/A	N/A
Airds of Kells Wood SSSI	National	No	N/A	N/A	N/A
Skyreburn Grasslands SSSI	National	No	N/A	N/A	N/A
Loch Ken and River Dee Marshes Ramsar	National	No	N/A	N/A	N/A
Habitats					
M15b <i>Trichophorum germanicum</i> - <i>Erica tetralix</i> wet heath (Blanket Bog (50 cm or more))	Local	Yes	Minor temporary adverse effect – Not significant	No significant effect	Minor temporary adverse effect – Not significant
M15b <i>Trichophorum germanicum</i> - <i>Erica tetralix</i> wet heath (Wet Heath (below 50 cm))	Local	Yes	Minor permanent adverse effect – Not significant	No significant effect	Minor adverse effect – Not significant
M17 <i>Trichophorum germanicum</i> - <i>Eriophorum vaginatum</i> blanket mire	Local	Yes	None	No significant effect	Minor adverse effect – Not significant
M18 <i>Erica tetralix</i> - <i>Sphagnum papillosum</i> raised and blanket mire	County	Yes	None	No significant effect	Minor adverse effect – Not significant

Receptor	Evaluation	Detailed assessment required	Construction	Operational	Decommissioning
M23 <i>Juncus effusus/ acutiflorus</i> - <i>Galium palustre</i> rush-pasture	Local	No	N/A	N/A	N/A
M25 <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire (above 50 cm)	Local	Yes	Minor temporary adverse effect – Not significant	No significant effect	Minor adverse effect – Not significant
M25a <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire (above 50 cm)	Local	Yes	Minor temporary adverse effect – Not significant	No significant effect	Minor adverse effect – Not significant
M25b <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire (below 50 cm)	Local	No	N/A	N/A	N/A
S8 <i>Scirpus lacustris</i> spp. <i>lacustris</i> swamp	Local	No	N/A	N/A	N/A
S9 <i>Carex rostrata</i> swamp	Local	No	N/A	N/A	N/A
Fauna					
Amphibians	Local	Yes	No significant effect	No significant effect	No significant effect
Reptiles	Local	Yes	No significant effect	No significant effect	No significant effect
Bats	Regional	Yes	Minor adverse effect – Not significant	Minor adverse effect (after curtailment)	No significant effect
Water vole	N/A	No	N/A	N/A	N/A
Otter	Local	Yes	Minor adverse effect – Not significant	No significant effect	No significant effect
Red Squirrel	Local	Yes	No significant effect	No significant effect	No significant effect
Badger	Local	Yes	No significant effect	No significant effect	No significant effect
<i>Pine marten</i>	<i>Local</i>	<i>Yes</i>	<i>No significant effect</i>	<i>No significant effect</i>	<i>No significant effect</i>
Fish	<i>County</i>	<i>Yes</i>	<i>No significant effect</i>	<i>No significant effect</i>	<i>No significant effect</i>

6.11 Summary and Statement of Significance

- 6.11.1. As a result of the design mitigation and further mitigation/monitoring in relation to bats and habitats, **no residual effects have been identified**. This Ecological Impact Assessment therefore concludes no significant adverse impacts in terms of the EIA Regulations, should the Proposed Development go ahead.

6.12 References

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