# TABLE OF CONTENTS



## TABLES

# 6 ECOLOGY

## 6.1 Introduction

6.1.1 This chapter considers the likely effects of the Proposed Development on ecological receptors at the Site (**Volume 3a, Figure 2.5a** and **b**) and surrounding Study Areas (**Volume 3a, Figure 6.1**), during construction and operation. This assessment is based upon comprehensive baseline data, comprising specifically of targeted ecological field surveys of important and legally protected ecological receptors identified during desk study and consultation feedback. It draws on pre-existing information, where appropriate, from other studies, survey data sources and CIEEM best practice guidance.

6.1.2 Alba Ecology Ltd. led on all aspects of the ecological fieldwork and assessment in association with the Proposed Development, except the Phase 1 Habitat and National Vegetation Classification (NVC) survey which was undertaken by Avian Ecology Ltd and the fish habitat survey which was undertaken by Waterside Ecology Ltd.

6.1.3 Alba Ecology is a highly experienced Scottish-based multi-disciplinary ecological consultancy that has worked in Scotland for many years. Alba's staff have led on, and contributed to, all aspects of Ecological Impact Assessment (EcIA) on many large-scale wind farm development projects, including the management of Ecological Clerks of Work (ECoW) teams, principal ornithological/ecological surveyors and advisors on planning applications, expert witness at Public Local Inquiry and production of EIA Reports and Habitat Regulations Assessments and Habitat Management Plans.

6.1.4 The ecological surveyors who undertook the surveys for the Proposed Development are Dr Kate Massey, Dr Peter Cosgrove, Cameron Cosgrove and Donald Shields of Alba Ecology Ltd., Dr Jon What and Isabel Isherwood of Waterside Ecology Ltd. and Mark Wood (formerly) of Avian Ecology Ltd. The surveyors have extensive ecological field experience across the north and west of Scotland and have attended regular training events led by experts, covering areas such as species identification, recording data concisely and accurately, navigation techniques and health and safety. Surveyors were trained to carry out surveying and mapping work in a systematic manner, following recognised standardised survey methods.

6.1.5 This chapter is supported by the following technical appendices and figures which are provided in **Volume 4**:

- **Technical Appendix 6.1**: Beinn Ghlas Wind Farm Repowering Natural Heritage Desk Study;
- **Technical Appendix 6.2**: Beinn Ghlas Wind Farm Repowering Habitat Survey Report;
- **Technical Appendix 6.3**: Beinn Ghlas Wind Farm Repowering Peatland Condition Assessment (PCA) Survey Report;
- **Technical Appendix 6.4**: Beinn Ghlas Wind Farm Repowering Site Access Habitat Survey Report;
- **Technical Appendix 6.5**: Beinn Ghlas Wind Farm Repowering Protected Terrestrial Mammal Survey Report;

- **Technical Appendix 6.6**: Beinn Ghlas Wind Farm Repowering Bat Survey Report;
- **Technical Appendix 6.7**: Beinn Ghlas Wind Farm Repowering Fish Habitat Survey Report;
- **Technical Appendix 6.8**: Beinn Ghlas Wind Farm Repowering Freshwater Pearl Mussel Survey Report;
- **Technical Appendix 6.9**: Beinn Ghlas Wind Farm Repowering Vegetation Survey of the Turbine Locations Report;
- **Technical Appendix 6.10**: Outline Beinn Ghlas Wind Farm Repowering Biodiversity Enhancement and Habitat Management Plan (OBE-HMP);
- **Technical Appendix 6.11**: Beinn Ghlas Wind Farm Repowering OBE-HMP Walkover Survey Report November 2023;
- **Technical Appendix 6.12**: Beinn Ghlas Wind Farm Repowering Habitat Importance evaluation and land-take calculations;
- **Technical Appendix 6.13**: Beinn Ghlas Wind Farm Repowering Deer Management Plan;
- **Confidential Technical Appendix 6.14**: Beinn Ghlas Wind Farm Repowering OBE-HMP Walkover Survey Report March 2024;
- **Technical Appendix 6.15:** Peatland Habitat and Restoration Opportunities for Beinn Ghlas Wind Farm Repowering;
- **Technical Appendix 6.16:** Beinn Ghlas Wind Farm Repowering Habitat Walkover Survey, 2025;
- **Technical Appendix 6.17:** Beinn Ghlas Wind Farm Repowering Mammal Walkover Survey, 2025; and
- A series of six ecological figures:
    - **Figure 6.1**: Ecological Study Areas;
    - **Figure 6.2**: Designated Sites;
    - **Figure 6.3**: Phase 1 Habitats and NVC Surveys;
    - **Figure 6.4**: PCA;
    - **Figure 6.5**: Potential GWDTE; and
    - **Figure 6.6**: Mammal Signs.

6.1.6 This chapter should be read alongside other chapters within the EIA Report, in particular **Volume 2, Chapters 2 - 4, 7** and **8**.

6.1.7 In accordance with best practice guidance, the ecological impact assessment involved the following key stages:

- Reference to relevant statutory and planning context (i.e. legislation, policy and guidance);
- Identification of likely zone of influence of the Proposed Development;
- Identification of potentially important ecological receptors likely to be affected by the Proposed Development – the so-called 'baseline conditions';
- Evaluation of important ecological receptors and features likely to be affected by the Proposed Development;
- Identification of likely impacts and magnitude of the Proposed Development on important ecological receptors;
- Assessment of the likely significant effects of the Proposed Development, including any mitigation and enhancement measures; and
- Assessment of any likely residual significant effects.

6.1.8 The term ‘receptor’ is used throughout this EIA process and is defined as the element in the environment affected by a development (e.g. a species or habitat in the case of ecology). The term ‘impact’ is also used commonly throughout the EIA process and is defined as a change experienced by a receptor (this can be beneficial, neutral or adverse). The term ‘effect’, which is also used commonly throughout the EIA process is defined as the consequences for the receptor of an impact. The use of the word ‘effect’ rather than ‘impact’ at the end of species and designated site accounts is based on the wording of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (Scottish Government, 2017) (hereafter referred to as the ‘EIA Regulations’) which requires the determination of ‘*likely significant effects*’.

6.1.9 Whilst considering a range of potential outcomes that could arise from the Proposed Development, the assessment reports the effects that are considered likely to be significant on the basis of evidence, standard guidance and professional judgement. It is these likely significant effects that the Applicant is obliged to report, and that the decision maker is obliged to consider.

## 6.2 Legislation and Policy

6.2.1 Relevant national planning policy, guidelines, international commitments, legislation and planning policies relevant to the protection, conservation and enhancement of ecological interests associated with the Proposed Development are outlined below. The approach used to assess the significance of likely effects of the Proposed Development upon ecological receptors is set in the context of:

- The Wildlife and Countryside Act 1981 (as amended);
- European Biodiversity Strategy (European Commission (EC) 2011 and 2020);
- EC Directive 1992/43/EEC on the conservation of natural habitats and of wild fauna and flora. Hereafter referred to as the 'Habitats Directive';
- The Conservation (Natural Habitats) Regulations 1994. Hereafter referred to as the 'Habitats Regulations';
- The Conservation of Habitats and Species Regulations 2010;
- The Nature Conservation (Scotland) Act 2004 (as amended);
- The Town and Country Planning (Environmental Impact Assessment ) (Scotland) Regulations 2017;
- The Water Framework Directive (European Parliament, 2000);
- PAN 1/2013 Environmental Impact Assessment;
- National Planning Framework 4 (NPF4) (Scottish Government, 2023);
- Planning Circular 1 2017: The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (Scottish Government, 2017);
- Biodiversity Strategy to 2045: Tackling the Nature Emergency in Scotland, Scottish Government, 2022 (updated 2023);
- Onshore Wind Policy Statement (Scottish Government, 2022);
- Protection of Badgers Scotland Act 1992;
- The Scottish Biodiversity List ((SBL) Scottish Government, 2013).
- The UK Biodiversity Action Plan (BAP) 2004; and
- Argyll and Bute Local Development Plan (and associated Technical Notes e.g. https://www.argyll-bute.gov.uk/environment/countryside/biodiversity) (Argyll and Bute Council).

6.2.2 The Scottish Government has recently published or drafted a series of relevant policy documents. The relevant policy is addressed fully in **Volume 2, Chapter 4** of this EIAR and the policy position as it applies to the Proposed Development is contained in the Planning and Sustainable Place Statement which is submitted to support the Application. In summary, the policy documents published by Scottish Government recognise the need to tackle the climate emergency and the nature crises in all aspects of life.

- NPF4 is a long-term plan for Scotland that guides spatial development, sets out national planning policies, designates national developments and highlights regional spatial priorities. NPF4 includes a range of policies that will contribute to delivering Scotland's commitment to net zero emissions by 2045 and tackling the climate emergency. Policy 3: Biodiversity, Policy 5: Soils, and Policy 6: Forestry, woodland and trees are particularly pertinent to this chapter.
- In December 2022, the Scottish Government launched a revised Scottish Biodiversity Strategy, which aims to tackle the twin crises of Climate Change and Nature Emergency. It's vision encompasses three main elements: (i) By 2045, Scotland will have restored and regenerated biodiversity across our land, freshwater and seas; (ii) Our natural environment, our habitats, ecosystems and species, will be diverse, thriving, resilient and adapting to climate change; and (iii) Regenerated biodiversity will drive a sustainable economy and support thriving communities, and people will play their part in the stewardship of nature for future generations.
- Scotland's Onshore Wind Policy Statement sets out the Scottish Government's ambition to deploy 20 GW of onshore wind by 2030, as well as related environmental considerations and explicitly addresses peat and carbon rich soils and examples of best practice as regards enhancing the natural environment.
- The Scottish Government draft planning guidance on biodiversity sets out the Scottish Ministers' expectations for implementing NPF4 policies which support the NPF4 outcome of 'improving biodiversity'.

6.2.3 The UK Biodiversity Action Plan (BAP) was the UK Government's 2004 response to the Convention on Biological Diversity, to which the UK was a signatory. Action plans for the most threatened species and habitats (called 'UK BAP species and habitats') were set out to aid recovery. Following the publication of the Convention on Biological Diversity's 'Strategic Plan for Biodiversity 2011–2020' (Convention on Biological Diversity, 2010), its commitment to 20 'Aichi targets', agreed at Nagoya Japan in October 2010, and the launch of the European Biodiversity Strategy in May 2011, the UK Government has changed its strategic thinking with regard to biodiversity conservation (which is also now a devolved matter in Scotland), but still often refers to UK BAP priorities in strategic documents.

6.2.4 The Scottish Biodiversity List (SBL) is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland, under the Nature Conservation (Scotland) Act 2004. The SBL therefore supersedes the UK BAP list of species and habitats (CIEEM, 2017). Nevertheless, since the definitions of SBL habitats are largely based on UK BAP definitions, these are still referred to where necessary. Note, the SBL is currently being revised.

## 6.3 Consultation Undertaken

6.3.1 In undertaking the assessment, consideration has been given to the Scoping Responses and other consultation which has been undertaken as detailed in **Table 6.1**.

**Table 6.1: Summary of consultation responses relevant to this chapter**

| Consultee | Issued Raised | Response/Action Taken |
|---|---|---|
| Statutory consultees | | |
| NatureScot – Ecology, August 2022 – Scoping response. | We understand that habitat surveys were completed in 2021 and we welcome the commitment for further protected species and habitat surveys to be undertaken to inform the EIA Report. Any deviations from guidance from current guidance should be explained in the EIA Report. | Ecological baseline surveys including a desk study, habitat surveys and protected species surveys have been undertaken following best practice guidance. Methods, results, limitations and any deviations from guidance are reported in the relevant **Technical Appendices 6.1-6.9, and 6.16** and summarised in **Section 6.5**. Survey work has been carried out on a continuing basis as the design iteration has evolved and the last surveys were carried out in 2025. |
| | Any new tracks required to accommodate the Proposal should be subject to the appropriate ecological surveys and assessment. If track widening works are required, then ecological surveys should also be conducted in those areas if there is a possibility of protected species or habitats being present. | Baseline surveys of the Site Access including habitats and protected species have been undertaken following best practice guidance. Methods, results, limitations and any deviations from guidance are reported in the relevant **Technical Appendices 6.4** and **6.5** and summarised in **Section 6.5**. |
| | As wild deer use the development site, the applicant should assess the implications of the Proposal on deer and the indirect impacts on other interests (e.g. habitats, neighbours, roads, etc.). This should be presented in the assessment as part of the EIA Report, even if you conclude that impacts are unlikely. The assessment may indicate the need for management to avoid adverse impacts. If so, we advise the need for a deer management statement, either as part of a Habitat Management Plan or as a stand-alone document. For some sites, the modification of an existing Deer Management Plan covering a wider area may be more appropriate. We do not expect developers to exert control over land that they have no rights over. However, we encourage a collaborative approach with neighbouring landowners and managers to avoid adverse impacts on the interests of all parties. A deer management statement may be included amongst the EIA Report's submitted mitigation measures, or produced to comply with a planning condition. Please see our guidance on what to consider and include in deer assessments and management at development sites (https://www.nature.scot/doc/guidance-planning-and-development-what-consider-and-include-deerassessment-and-management). | Baseline surveys of habitats considered impacts from deer. Deer management forms part of the OBE-HMP see **Technical Appendix 6.10**. A deer management statement is provided in **Technical Appendix 6.13.** |

| Consultee | Issued Raised | Response/Action Taken |
|---|---|---|
| | We are content with the intended suite of ecological surveys. For information, we now have our protected species advice on our website as standing advice notes. These should be referred to for further advice in relation to survey requirements, mitigation and licensing:<br>https://www.nature.scot/professionaladvice/planning-and-development/planning-and-developmentadvice/planning-and-developmentprotected-species<br>A reminder that species surveys and licence requirements are required with the application, before planning consent is issued, particularly in relation to bats (European Protected Species). Again, there is guidance in the species advice notes above. | Baseline surveys including a desk study, habitat surveys and protected species surveys have been undertaken following best practice guidance. Methods, results, limitations and any deviations from guidance are reported in the relevant **Technical Appendixes 6.1-6.9** and **6.16 &.17** and summarised in **Section 6.5**.<br>Experienced surveyors undertook surveys with suitable licences where relevant (e.g. freshwater pearl mussel surveys).<br>Mitigation is considered through the EIAR and reported in **Sections 6.6, 6.8** and the OBE-HMP (**Technical Appendix 6.10**).<br>Note that both reptile and macro-invertebrate surveys were scoped out of the ecological surveys at scoping stage and NatureScot was content with the advised approach. |
| NatureScot – Peatland, August 2022 – Scoping response. | The scoping layout indicates that parts of the site are underlain with Class 2 peatlands which are nationally important carbon rich soils, deep peat and priority peatland habitats. As such, there is a requirement for a complete peat probing survey to be undertaken, and an associated NVC survey, to ascertain the quality and distribution of peatland and priority habitats across the site as per NatureScot guidance (https://www.nature.scot/doc/advising-carbon-rich-soils-deep-peat-and-priority-peatland-habitatdevelopment-management).<br>Albeit that peatland classifications may change in light of detailed site-specific surveys, we advise that efforts are made to avoid the siting of turbines and associated infrastructure on areas of nationally important peatland and areas of deep peat. The EIA Report should demonstrate that any significant effects have been substantially overcome by siting, design or other mitigation. Details of all mitigation, including a peatland management plan and a habitat management plan should be included in the EIA Report.<br>It would be helpful to gauge the assessment of potential impacts, the attached Peatland Importance Table should be completed and included within the EIA Report. We assume that this information will be proposed for inclusion already, so we anticipate that this table should make the assessment of wider countryside peatland habitat much easier to gauge. We refer the Applicant to SEPA for advice on the | Baseline surveys of habitats have been undertaken following best practice guidance including Phase 1 Habitat and NVC surveys reported in **Technical Appendix 6.2**. A PCA was also undertaken for areas identified as blanket bog and is reported in **Technical Appendix 6.3**. Peat probing was undertaken and is reported in **Chapter 9**. The vegetation within the Development Footprint (defined in **Table 6.2**) is considered in detail in relation to peatland and peatland condition and is reported in **Technical Appendix 6.9**.<br>The importance of peatland habitat is considered in **Technical Appendix 6.12.**<br>The mitigation hierarchy has been carefully followed so that any likely significant effects have been substantially overcome by siting, design or other mitigation. This is demonstrated **in Technical** |

| Consultee | Issued Raised | Response/Action Taken |
|---|---|---|
| | methodology and scope of the hydrology and hydrogeology assessment. | **Appendix 6.3, 6.9**, **Section 6.8** and **Chapter 4**. |
| Scottish Environment Protection Agency (SEPA), August 2022 – Scoping response. | GWDTE [groundwater dependant terrestrial ecosystem] are protected under the Water Framework Directive and therefore the layout and design of the development must avoid impact on such areas. The following information must be included in the submission:<br>a) A map demonstrating that all GWDTE are outwith a 100 m radius of all excavations shallower than 1 m and outwith 250 m of all excavations deeper than 1 m and proposed groundwater abstractions. If micro-siting is to be considered as a mitigation measure the distance of survey needs to be extended by the proposed maximum extent of micro-siting. The survey needs to extend beyond the site boundary where the distances require it.<br>b) If the minimum buffers above cannot be achieved, a detailed site specific qualitative and/or quantitative risk assessment will be required. We are likely to seek conditions securing appropriate mitigation for all GWDTE affected.<br>4.2. Please refer to Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems for further advice and the minimum information we require to be submitted. | Baseline habitat surveys, including an assessment of potential GWDTE were completed. Details of the survey methodology and results are provided in **Technical Appendix 6.2 - 6.4** and **6.14** and summarised in **Section 6.5.**<br>GWDTE are considered further in **Chapter 8**. |
| Fisheries Management Scotland, August 2022 – Scoping response. | Fisheries Management Scotland (FMS) represents the network of Scottish District Salmon Fishery Boards (DSFBs), who have a statutory responsibility to protect and improve salmon and sea trout fisheries and the network of fishery trusts who provide a research, educational and monitoring role for all freshwater fish. FMS act as a convenient central point for Scottish Government and developers to seek views on local developments. However, as we do not have the appropriate local knowledge, or the technical expertise to respond to specific projects, we are only able to provide a general response with regard to the potential risk of such developments to fish, their habitats and any dependent fisheries. Accordingly, our remit is confined mainly to alerting the relevant local DSFB/Trust to any proposal. The proposed development straddles the river catchments relating to the Argyll DSFB and Argyll Fisheries Trust. It is important that the proposals are conducted in full consultation with the Board/Trust, and I should be grateful if they could be involved in the project proposals. I have also copied this response to the relevant personnel at both organisations.<br>Due to the potential for such developments to impact on migratory fish species and the fisheries they support, FMS have developed, in conjunction with Marine Scotland Science, advice for DSFBs and Trusts in dealing with planning applications. We would strongly recommend that these guidelines are fully considered throughout the planning, construction and monitoring phases of the proposed development. | Baseline fish habitat surveys were completed in suitable watercourses around the Turbine Study area. Details of the survey methodology and results are provided in **Technical Appendix 6.7** and summarised in **Section 6.5**.<br><br>There was no response from Argyll DSFB and Argyll Fisheries Trust. |

| Consultee | Issued Raised | Response/Action Taken |
|---|---|---|
| Argyll and Bute Council, May 2023 – Scoping response. | At time of writing advice from the Council's Local Biodiversity Officer (LBO) has not been obtained. It is therefore not possible to provide comment on the scope of these assessments. | Nevertheless, full ecological baseline surveys including a desk study, habitat surveys and protected species have been undertaken following best practice guidance. Methods, results, limitations and any deviations from guidance are reported in the relevant **Technical Appendices 6.1 - 6.9** and summarised in **Section 6.5.** |
| NatureScot, Feb 2024 – Gatecheck response. | Having reviewed the Gatecheck report, we are content that the Applicant appears to have taken on board the advice we have provided to date with regards to the scope of the Environmental Impact Assessment (EIA). However, at this stage there is no opportunity to comment on the quality of the work undertaken. Therefore, please note that our advice is given without prejudice to a full and detailed consideration of the impacts of the proposal if submitted for formal consultation as part of the EIA process.<br><br>We note Section 2.5.6 it is stated "areas of deep peat (>1 m depth)" have been avoided regarding siting turbines and infrastructure. For clarification, peat depth of 0.5m or more qualifies as deep peat. As per our scoping response, it would be helpful to gauge the assessment of potential impacts, if the attached Peatland Importance Table could be completed and included within the EIA Report. We assume that this information will be proposed for inclusion already, so we anticipate that this table should make the assessment of wider-countryside peatland habitat much easier to gauge.<br>Prior to the publishing of the EIA Report, we wish to draw the Applicant's attention to our 'general pre-application / scoping advice to developers of onshore wind farms' guidance, in particular to the preferred formatting of the report and associated figures and appendices. This document is regularly updated over to time to reflect any changes to available information and our guidance, so users should ensure they refer to the most up to date version before use. Within the guidance there are numerous sections relating to repowering of wind farms | NatureScot's standard guidance has been considered throughout. Deep peat is considered in detail in **Chapter 8.** |
| Non-statutory consultees | | |
| Royal Society for the Protection of Birds (RSPB). | According to the ECU (Oct, 2022) no formal response was received from RSPB in relation to the request for Scoping opinions in 2022. | Nevertheless, full ecological baseline surveys including a desk study, habitat surveys and protected species have been undertaken following best practice guidance. Methods, results, limitations and any deviations from guidance are reported in the relevant **Technical Appendices 6.1- 6.9** and **6.16 & 6.17** and |

| Consultee | Issued Raised | Response/Action Taken |
|---|---|---|
| | | summarised in **Section 6.5.** Ornithology is considered in **Chapter 6.** |
| Scottish Wildlife Trust (SWT). | According to the ECU (Oct, 2022) no formal response was received from SWT in relation to the request for Scoping opinions in 2022. | Nevertheless, full ecological baseline surveys including a desk study, habitat surveys and protected species have been undertaken following best practice guidance. Methods, results, limitations and any deviations from guidance are reported in the relevant **Technical Appendices 6.1- 6.9** and **6.16 & 6.17** and summarised in **Section 6.5.** |

## 6.4 Approach to the Assessment

### Scope of Assessment

6.4.1 Through a combination of scoping, desk studies and CIEEM best practice guidance, key ecological surveys were identified to consider the potential impacts of the Proposed Development on ecological receptors, which are specified in **Section 6.8**.

### Baseline Methodology

6.4.2 These studies included:

- a natural heritage desk study;
- a Phase 1 Habitat survey;
- a NVC survey;
- a GWDTE survey;
- a PCA;
- a protected terrestrial mammal survey;
- a bat survey;
- a fish habitat survey;
- a freshwater pearl mussel survey; and
- vegetation assessment of turbine locations.

6.4.3 The ecological surveys included a desk study of historical information sources and a series of targeted field surveys of potentially important and/or legally protected ecological receptors. Further details of ecological survey methodologies and results can be found in **Technical Appendices 6.1 - 6.9** and **6.16 - 6.17**.

*Issues Scoped Out*

6.4.4 Ecological impacts arising from the process of decommissioning have been scoped out of this assessment. An assessment of the ecological impacts of decommissioning the Proposed Development has not been undertaken as part of the EIA because: (i) the future baseline conditions (environmental and other developments) cannot be predicted accurately at this stage; (ii) the proposals for decommissioning are not known at this

stage, and (iii) the best practice decommissioning guidance methods will likely change during the lifetime of the Proposed Development and so cannot be predicted at this stage. Nevertheless, the Applicant commits to an additional consultation one year in advance of the year of decommissioning and to implement best practice decommissioning methods at the time of decommissioning. General decommissioning plans for the Proposed Development are considered within **Chapter 2**. Decommissioning of the operational Beinn Ghlas Wind Farm forms part of the Proposed Development. Information on this is provided in **Chapter 2**.

6.4.5 The EIA Regulations require all '*likely significant effects'* (beneficial and adverse) to be considered. This is usually taken to mean site specific related effects, although this is not as straightforward as it first appears to be. For example, the benefits to ecological receptors within the Study Areas stemming from the contribution made by the Proposed Development towards countering the climate crisis through renewable energy generation cannot yet be quantified. Nevertheless, it is clear that a wind farm of the size of the Proposed Development would make a beneficial contribution to meeting national $CO_2$ emission targets as well as reducing actual $CO_2$ emissions, helping to combat climate change, a significant threat to habitats and species globally. Uncertainties regarding climate change predictions mean that it is not possible at present to carry out a quantitative assessment of the beneficial impacts of wind farms to habitats and species through combatting climate change. Therefore, these have been scoped out of further consideration within this assessment, although the contribution wind farm developments make to tackling climate change are explicitly acknowledged in recent Scottish polices e.g. NPF4 and are considered in the Planning Statement.

6.4.6 Baseline data for freshwater macro-invertebrates are generally used for monitoring water quality and establishing baseline conditions. Based on the Scoping consultation, these potential receptors have been scoped out of further consideration within the EIAR. However, pre-construction surveys will be undertaken for baseline monitoring purposes. Likewise, reptiles have been scoped out of further assessment within the EIAR. The scoping document stated "*Reptile surveys are considered unnecessary for this Proposed Development. It will be assumed that there is a low number of reptiles in the suitable habitat across the Study Area. In light of these findings, reptiles will not be subject to further consideration within the EIAR"* and NatureScot's scoping response stated they were content with the approach (**Table 6.1**).

**Assessment Methodology**

6.4.7 This section defines the criteria which were used to evaluate the significance of predicted likely effects on ecological receptors due to the construction and operation of the Proposed Development. A level of confidence (whether the predicted effect is certain, likely, possible or unlikely) is attached to the predicted effect.

*Guidance*

6.4.8 The main guidance documents used for this EcIA are the following:

- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, 3rd Edition (CIEEM, 2018; version 1.3 updated 2024);
- Bat Mitigation Guidance. (CIEEM, 2023);

- Biodiversity net gain: Good practice principles for development: A practical guide. (CIRIA, CIEEM and IEMA, 2019);
- Biodiversity New Gain in Scotland, (CIEEM Scotland Policy Group, 2019);
- NatureScot (2023), Advising on carbon-rich soils, deep peat and priority peatland habitat in development management;
- NatureScot (2023) Planning and development: standing advice and guidance documents;
- Scottish Environment Protection Agency (SEPA) Guidance Note 4: Planning guidance on on-shore windfarm developments. LUPG-GU4 Version 9, (SEPA, 2017a);
- SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. LUPG-GU31 Version 3 (SEPA, 2017b);
- Scottish Soils (2016) Carbon and Peatland Map;
- Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems (SEPA, 2024).
- The Bat Conservation Trust (BCT) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition);
- NatureScot, Natural England, Natural Resources Wales, RenewableUK. Scottish Power Renewables, Ecotricity Ltd., the University of Exeter and Bat Conservation Trust (2021). Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation; and
- NatureScot (2025), Guidance on the use of existing biodiversity metrics in the Scottish planning system.

*Study Areas*

6.4.9 The following geographic definitions are used in this chapter and associated technical appendices[1] (**Volume 3a, Figure 6.1; Table 6.2**).

**Table 6.2: Geographic definitions**

| Term | Definition |
|---|---|
| The Site | This refers to all the land within the Proposed Development site boundary shown on **Figure 6.1** and **Figures 2.5a** and **b**. |
| Site Access | This refers to the route from the public road (A85) to the turbine array area. |
| The Development Footprint | This refers to the footprint of the Proposed Development infrastructure within the Site. It includes the proposed turbines and proposed track as shown in Figure 6.1 and also the associated infrastructure, a permanent meteorological mast, an internal access route network, transformers and underground cables, onsite sub-station / control building and two temporary construction compound as shown in Figure 2.5a and b. |
| The Study Areas | The overall ecological Study Area comprises of two discrete areas that were investigated, surveyed and assessed at different times during the project evolution: (i) Turbine Study Area and (ii) Site Access Study Area. When the all-encompassing term the 'Study Areas' is used it refers to both of these areas. |
| Turbine Study Area | The Turbine Study Area equates to all the land within the Site which was considered to have potential for turbines, plus an appropriate survey buffer |

[1] Technical Appendixes define and display in Volume 3a, Figures the relevant Study Area within the report that were correct at the time of the Survey.

| Term | Definition |
|---|---|
| | (**Volume 3a, Figure 6.1**). This buffer can be variable depending on the ecological receptor and is described in the relevant technical appendices.<br>For habitats the Turbine Study Area (as shown in **Volume 3a, Figure 6.1**) equates to the Site, not including the Site Access, plus a c. 250 m buffer and the original Beinn Ghlas Wind Farm HMP Area. For protected terrestrial mammals the Turbine Study Area was the Site, not including the Site Access, plus a 500 m buffer. |
| Site Access Study Area | Additional habitat and protected terrestrial mammal surveys were conducted along the Site Access plus a 100 m buffer which ran from the A85 at grid reference ca. NM 968 324 in the north, through Fearnoch Forest along current Forestry and Land Scotland (FLS) tracks, through Am Barr to Barguillean Farm where it follows the current access track until it meets the Turbine Study Area (as shown in **Volume 3a, Figure 6.1**). Where this area is being discussed specifically it is termed the Site Access Study Area. |
| The Designated Site Search Area | A 10 km buffer around the Turbine Study Area was used as a search area for designated sites as part of the natural heritage desk study (**Technical Appendix 6.1, Volume 3a, Figure 6.2**) |
| OBE-HMP Area and the existing HMP Area | Area in which OBE-HMP works will be undertaken (as shown in **Volume 3a, Figure 6.1**). The Existing HMP Area will continue to be an HMP area for the Proposed Development. |

*Criteria for Evaluating Importance*

6.4.10 The ecological receptors identified in the baseline studies were evaluated following best practice guidelines (e.g. CIEEM, 2018). Identifying the importance of potential ecological receptors was the first step of the evaluation process, and those considered important were then subject to detailed survey and assessment. Those considered sufficiently widespread, unthreatened and resilient to the potential impacts of the Proposed Development were scoped out of further assessment as per best practice guidance (CIEEM, 2018).

6.4.11 Ecological receptors can be important for a variety of reasons and the rationale used to define their importance has been explained to demonstrate a robust selection and evaluation process. Importance may relate, for example, to the quality or extent of designated sites or habitats, to habitat/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline. Various characteristics contribute to the potential importance of ecological receptors within a study area, including:

- naturalness;
- animal or plant species, sub-species or varieties that are rare or uncommon, either internationally, nationally or more locally, including those that may be seasonally transient;
- ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages;
- endemic species or locally distinct sub-populations of a species;
- habitats that are rare or uncommon;
- habitats that are effectively irreplaceable;
- habitat diversity;
- size of habitat or species population;
- habitat connectivity and/or synergistic associations;

- habitats and species in decline;
- rich assemblages of plants and animals;
- large populations of species or concentrations of species considered uncommon or threatened in a wider context;
- plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species-poor communities; and
- species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

6.4.12 Guidance on EcIA (CIEEM, 2018) sets out categories of ecological or nature conservation importance that relate to a geographical framework (e.g. international through to local) together with criteria and examples of how to place a site (defined by its ecological attributes) into these categories. It is generally straightforward to evaluate sites or species populations designated for their international or national importance (as criteria for defining these exist e.g. Special Areas of Conservation (SAC) or Site of Special Scientific Interest (SSSI), but for sites or populations of regional or local importance, criteria may not be easily defined. Where possible, the potential importance of an ecological receptor has been determined within a geographical context using categories outlined in **Table 6.3.**

**Table 6.3: Summary of geographical importance of species or habitats**

| Importance term | Example |
|---|---|
| International | For example;<br>>1 % of European Community (EC) population/resource of habitat that are the considered internationally important (e.g. listed on Annex 1 of the Habitats Directive); and/or Species or habitats named as a designating feature within an international designated site, e.g. SAC, Ramsar. |
| National | For example;<br>>1 % of national (UK/Scotland) population/resource of habitat listed on the SBL; Species or habitats named as a designating feature within a nationally designated site, e.g. SSSI; Potentially, a species or high-quality habitat linking two (or more) nationally designated sites, which are designated for that feature; and/or Potentially, a habitat of particular high quality, which is rare and/or meets SSSI selection criteria. |
| Regional | For example;<br>>1 % of Regional (Argyll and Bute) population/area of population/area of habitat; Potentially, a species or high-quality habitat connected to a nationally important site, or forming a link with a nationally important site, that is designated for that feature; and/or Species or habitats, that are not within a designated site, but are particularly diverse or at the edge of their range. |
| Local | For example;<br>Commonplace and widespread species and habitats, which, despite their ubiquity, contribute to the ecological function of the local area (local habitat networks etc). Habitats and species considered to be of local importance; here taken to be the Lorn geographical area. |

6.4.13 It should be noted that there is no fundamental biological reason to take 1 % of a population as the threshold level for establishing the level of importance of a site. Nevertheless, this percentage is widely considered to be of value in developing measures that give an appropriate level of protection to populations and has gained acceptance on

this basis throughout the world. The criterion was, for example, adopted by parties involved in the Ramsar Convention 1971. Thereafter, the 1 % level of national species totals has been taken as the basis of assessment in various countries, including Britain (Stroud *et al*., 1990).

6.4.14 The ecological importance afforded to a habitat or species within a site or study area, is determined by both the geographical context, as well as the range of ecological characteristics of the habitat or species exhibit. For example, a habitat in any condition within a study area, which is >1 % of the national total could be considered nationally important, whereas a habitat smaller than this, but considered to be of particular high quality (for example, meeting SSSI selection criteria) and/or are connected to and providing a potentially important stepping-stone between designated sites, may also be considered regionally or nationally important.

6.4.15 The importance attached to an ecological receptor can also be determined according to legislative status. Some ecological receptors are subject to a general level of legal protection through the Wildlife and Countryside Act 1981 (as amended) and others under the Habitats Directive. There is no clear guidance for conservation importance of ecological receptors other than those of European Protected Species and nationally designated site species. The importance of other species is based on professional judgement using the characteristics outlined above. The status of potentially important receptors, such as SBL species and species with proportionally large populations within a study area, is taken into consideration.

6.4.16 For the avoidance of doubt, CIEEM guidance makes it clear that species which appear on national lists e.g. Schedule 1 of the Wildlife and Countryside Act (1981 as amended) or the SBL, are not necessarily evaluated as of national importance simply by appearing on such a list. Importance evaluation must consider the number of individuals of species within a geographical context/scale, i.e. how many of a particular species are likely to be affected by the Proposed Development and what proportion of the local/regional/national population does this constitute. Legal listing or protection is a separate but important consideration.

6.4.17 The importance evaluation of peatland habitats takes NatureScot's Carbon and Peatland Map (2016) into consideration. The Carbon and Peatland Map is "*a predictive tool which provides an indication of the likely presence of peat on each individually mapped area, at a coarse scale. The types of peat shown on the map are: carbon-rich soils, deep peat and priority peatland habita*t" (SNH, 2019). It has been used to predict areas that make up part of Scotland's nationally important resource peatland with Class 1 and Class 2 predicted to be forming the Nationally Important peatland:

- Class 1: Nationally important carbon-rich soils, deep peat and priority peatland habitat; and Areas likely to be of high conservation value.
- Class 2: Nationally important carbon-rich soils, deep peat and priority peatland habitat; and Areas of potentially high conservation value and restoration potential.
- Class 3: Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat.
- Class 4: Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils.

- Class 5: Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat.
- Class 0: Mineral soil - Peatland habitats are not typically found on such soils.
- Class -1: Unknown soil type.
- Class -2: Non-soil (e.g. loch, built up area, rock and scree).

6.4.18 However, the Carbon and Peatland Map can only predict that carbon-rich soils, deep peat and priority peatland habitat might be present. The predictive map is intended to be a helpful tool in the initial site selection process undertaken by developers (SNH, 2019).

6.4.19 NatureScot (2023) note that the Carbon and Peatland Map "*is a useful guide to screen where areas of peatland are likely to occur, but should not be regarded as definitive*". … "*Developments on peat will always require a recent peat and vegetation survey to confirm the quality and distribution of peatland across the whole development area. The Carbon and Peatland 2016 map should be used as a tool for identifying likely locations where these surveys will be required*."

6.4.20 In summary, the importance evaluation of an ecological receptor takes into account a multitude of attributes and is carefully considered in a site/species/habitat specific manner. Once the importance of an ecological receptor has been determined, the potential impacts on that receptor are considered in terms of magnitude, extent, duration, frequency and timing, reversibility, sensitivity and whether the predicted impacts would likely be beneficial, adverse or neutral.

*Criteria for Evaluating Potential Impacts and Effects*

6.4.21 In accordance with best practice EcIA guidance (e.g. CIEEM, 2018), the assessment of impacts involves identifying the baseline conditions, identifying and characterising impacts and their effects through transparent and defined characteristics to ultimately determine if the predicted impacts are likely to result in significant and measurable biological effects.

**Beneficial or Adverse**

6.4.22 According to CIEEM (2018), positive and negative impacts and effects should be determined according to whether the change is in accordance with nature conservation objectives and policy. These terms are defined as:

- Positive – a change that improves the quality of the environment e.g. by increasing species diversity, extending habitat or improving water quality. This may also include halting or slowing an existing decline in the quality of the environment.
- Negative – a change which reduces the quality of the environment e.g. destruction of habitat, habitat fragmentation, pollution.
- Impacts and effects can also be assessed as neutral.

**Extent**

6.4.23 According to CIEEM (2018) the extent, or zone of influence, is the spatial or geographical area over which the predicted impact/effect may occur under a suitably representative range of conditions.

### Magnitude

6.4.24 According to CIEEM (2018), magnitude refers to size, amount, intensity and volume. It should be transparently quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population. CIEEM guidance does not encourage the use of artificial magnitude criteria, but for consistency with other EIA Report chapters, in this assessment there are considered to be four levels of magnitude of impact (**Table 6.4**) and it is assumed these are adverse, unless otherwise stated. Consequently, in this chapter magnitude metrics are provided wherever possible in both absolute and/or relative terms and also refer to these magnitude criteria.

**Table 6.4: Summary of magnitude criteria used**

| Magnitude | Summary |
|---|---|
| Large | Total/near total loss of a population/habitat due to mortality or displacement. Total/near total loss of breeding productivity in a population due to disturbance. E.g. ≥50 % of population/habitat affected. |
| Medium | Moderate reduction in the status or productivity of a population/habitat due to mortality or displacement or disturbance. E.g. 10-49 % of population/habitat affected. |
| Small | Small but discernible reduction in the status or productivity of a population/habitat due to mortality or displacement or disturbance. E.g. 1-9 % of population/habitat affected. |
| Negligible | Very slight reduction in the status or productivity of a population due to mortality or displacement or disturbance. Reduction barely discernible, approximating to the 'no change' situation. E.g. <1 % population/habitat affected. |

### Duration

6.4.25 According to CIEEM (2018), duration should be defined in relation to ecological characteristics (such as the life-cycle of a species). The duration of an activity may differ from the duration of the resulting effect caused by the activity. Impacts and effects may be described as short, medium or long-term and permanent or temporary and should be defined. In this assessment three broad time-frames are used: short term (up to two years), medium term (two-five years) and long term (between 5 years and the lifetime of the Proposed Development).

### Frequency and Timing

6.4.26 According to CIEEM (2018), the number of times an activity occurs will influence the resulting effect. For example, a single person walking a dog once will have very limited impact on nearby otters using a wetland habitat, but numerous dog walkers will subject the otters to frequent disturbance and could affect their breeding success, leading to displacement and knock-on effects on their ability to survive. The timing of an activity or change may result in an impact if it coincides with critical life-stages or seasons.

### Reversibility

6.4.27 According to CIEEM (2018), an irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible

or which may be counteracted by mitigation. In some cases, the same activity can cause both reversible and irreversible effects.

**Likelihood**

6.4.28 A level of confidence (whether the predicted impact is certain, likely, possible or unlikely) can be attached to a predicted effect.

**Sensitivity Criteria**

6.4.29 Another factor when assessing potential impacts is the behavioural sensitivity of the ecological receptor under consideration (e.g. high, medium or low) and the potential zone of influence. Different receptors respond differently to stimuli, making some particularly sensitive to development activities and others less so. Professional judgement is used when assigning sensitivity to an ecological receptor and this is recorded in this EcIA in a clear and transparent way. Sensitivity criteria vary across the wide range of taxonomic groups considered in an EcIA and are therefore provided in the receptor descriptions of this chapter.

6.4.30 By way of example, sensitivity is determined according to species' behaviour, using broad criteria set out in **Table 6.5**. Behavioural sensitivity can differ between species and between individuals of the same species. Therefore, sensitivity is likely to vary with both the nature and context of the disturbance activity as well as the experience and even 'personality' of the species, in the case of mammals. Sensitivity also depends on the activity the species is undertaking and when it is doing it. For example, a species is likely to be less tolerant of disturbance during the breeding season than at other times of year. Thus, sensitivity changes with both space and time.

**Table 6.5: Summary of sensitively criteria used**

| Magnitude | Summary |
|---|---|
| High | Species occupying remote areas away from human activities or exhibiting strong and long-lasting reactions to disturbance events. Habitats that are considered to have a slow recovery time to disturbance. |
| Medium | Species that appear to be warily tolerant of human activities or exhibiting short-term reactions to disturbance events. Habitats that are considered to have a moderate recovery time to disturbance. |
| Low | Species occupying areas subject to frequent human activity and exhibiting mild and brief reaction to disturbance events. Habitats that are considered to have a quick recovery time from disturbance. |

*Determination of Significance*

6.4.31 Significance is a concept related to the weight that should be attached to predicted effects when decisions are made. For the purposes of EcIA a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for important ecological receptors (CIEEM, 2018). There could be any number of possible impacts on important ecological features arising from a development. However, it is only necessary to describe in detail the impacts that are *likely to be significant*. Impacts that are either unlikely to occur, or if they did occur are unlikely to be significant, can be scoped out.

6.4.32 In the context of the EIA Regulations (2017), each likely effect is evaluated and classified as either significant or not significant, using professional judgement, evidence and best practice guidance. In this assessment, an ecologically significant effect is defined as an "*impact on the structure and function of a defined site, habitat or ecosystem and the conservation status of habitats and species (including extent, abundance and distribution). Significant effects should be qualified with reference to an appropriate geographical scale*". Thus, the geographical terms of reference at which a predicted effect may be considered significant must also be defined (e.g. an effect on a species population or habitat area evaluated to be of regional importance at a given site is likely to be either significant or not at the regional level). Effects can be considered significant at a wide range of scales from international to local.

6.4.33 There is often confusion over geographical context, potentially important receptors and quantifying predicted effects and EcIA best practice guidance has often struggled to articulate this clearly. For example, if a potentially important species appears on a conservation list e.g. the SBL and there is a predicted impact, the geographical context in which the receptor is found must be considered. Therefore, the simple presence of a species on the SBL within a proposed development area does not mean that likely effects are significant at the national (Scottish) level. For that to occur, the proposed development must have significant effects on its national population (CIEEM, 2018).

6.4.34 There are a number of approaches for determining the significance of effects on ecological features. This includes methods for scoring and ranking impacts on the basis of subjective criteria. Results are often presented in the form of a matrix. A matrix approach is commonly used in EIA by disciplines other than ecology to assign significant residual effects to categories. CIEEM (2018) guidance recommends avoidance and discourages use of the matrix approach and categorisation for ecology. Therefore, a matrix approach has not been adopted in this chapter, with a more discursive approach adopted instead (e.g. Box *et al., 2017)*.

*Favourable Conservation Status*

6.4.35 A species' conservation status is taken as the sum of the influences acting on it which may affect its long-term distribution and abundance, within the geographical area of interest. The term 'Favourable Conservation Status' (FCS) as articulated within the EC Habitats Directive is important and NatureScot advises on its use and context in relation to birds[2], where guidance is much more explicit than for other species and habitats. FCS has also been used more recently within the Environmental Liability Directive as the basis of a test of environmental damage to protected species and habitats (e.g. NatureScot, 2018).

6.4.36 NS (2018) recommend that the concept of FCS should be applied at the level of its Scottish population, to determine whether an impact is sufficiently significant to be of concern, noting that an adverse impact on a species or habitat at a regional scale may adversely affect its national conservation status.

6.4.37 Conservation status is considered favourable where three tests are met:

[2] SNH. 2006. Assessing Significance of Impacts from Onshore Windfarms on Birds Outwith Designated Areas. SNH guidance.

- Population dynamics indicate that the bird species is maintaining itself on a long-term basis and is therefore likely to persist in the habitat it occupies;
- The natural range of the bird species is not being reduced, nor is it likely to be reduced in the foreseeable future; and
- There is (and will continue to be) a sufficiently large habitat area to maintain its populations on a long-term basis.

6.4.38 For the avoidance of doubt, the FCS of important ecological receptors should be maintained following a proposed development. Whilst considering a range of potential outcomes that could arise from the Proposed Development, the assessment reports the effects that are considered likely to be significant on the basis of evidence, standard guidance and professional judgement. It is these likely significant effects (often focussed around the concept of FCS) that the Applicant is obliged to report, and that the decision maker is obliged to consider.

*Requirements for Mitigation*

6.4.39 Policy and guidance including NPF4, the Scottish Government Draft Planning Guidance for Biodiversity (2023) and best practice EcIA guidance e.g. CIEEM (2018) identifies a hierarchy of mitigation for potential ecological impacts.

6.4.40 The mitigation hierarchy is taken as:

- Avoid;
- Minimise;
- Restore;
- Offset/compensate; and
- Enhance.

6.4.41 The wording for the mitigation hierarchy differs between NPF4, the Draft Planning Guidance for Biodiversity and CIEEM (2018), but the overall principles remain similar. It is worth noting that the wording of the Scottish EIA Regulations (2017) is that "*mitigation measures are taken to mean any features of the development and any measures envisaged in order to avoid, prevent or reduce and, if possible,* ***offset likely significant adverse effects*** *on the environment*" (bold emphasis added).

6.4.42 The term 'mitigation hierarchy' is widely used throughout NPF4 demonstrating its importance in development plans, particularly the need to demonstrate that adverse impacts are first avoided and then minimised through best practice. CIEEM (2018) states that "*Avoiding and/or minimising negative impacts is best achieved through consideration of potential impacts of a project from the earliest stages of scheme design and throughout its development*". This approach, to avoiding potential adverse impacts within a design layout, is sometimes described as embedded mitigation or mitigation by design. "*Mitigation by design is particularly beneficial as there is greater certainty that it will be delivered*" (CIEEM, 2018).

**Avoidance**

6.4.43 According to NPF4 avoidance is achieved, whenever possible, by removing the predicted negative impact at the outset. According to CIEEM (2018), adverse effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed. For example, through a

planning condition. The baseline habitat surveys influenced the project design, avoiding wherever possible areas of higher ecological sensitivities. As part of best practice, it is considered important to demonstrate transparently where impact avoidance has taken place in the design iteration process (e.g. **Chapter 2** and **Section 6.6**).

**Minimisation**

6.4.44 According to NPF4, minimisation is achieved by reducing the predicted impacts. According to CIEEM (2018), where design layout impacts on important ecological receptors cannot be avoided, they should be minimised. Minimisation takes many forms, with subsequent design iteration being tweaked and amended where possible to reduce potential ecological impacts. As part of best practice, it is also considered important to demonstrate transparently where impact minimisation has taken place in the design iteration process (e.g. **Chapter 2** and **Section 6.6**).

**Restore**

6.4.45 According to NPF4 the term 'restore' is defined as repairing damaged habitats. There is limited guidance on this aspect of the mitigation hierarchy, but for the purposes of this chapter it is understood to mean that habitats which are impacted by the Proposed Development should be restored.

**Compensation/offset**

6.4.46 According to NPF4 the term 'offset' is achieved by compensating for the residual impact that remains, with preference to on-site over off-site measures. Where there are significant residual adverse ecological effects, despite the mitigation proposed, these should, under EcIA guidelines (i.e. CIEEM, 2018) and the EIA Regulations (2017), be offset by appropriate compensatory measures.

**Enhancement**

6.4.47 There is now an overriding consensus of policy and guidance that development plans should not just try to avoid causing likely significant effects but go much further. NPF4, Policy 3 states: "*Development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats and building and strengthening nature networks and the connections between them. Proposals should also integrate nature-based solutions, where possible*." Best practice EcIA guidance recommends seeking to provide net benefits for important biodiversity over and above design requirements for avoidance, minimisation or compensation (e.g. CIEEM, 2018).

6.4.48 The Scottish Government Draft Planning Guidance for Biodiversity (2023) states that in order for biodiversity to be 'enhanced' it will need to be demonstrated that it will be in an overall better state than before intervention, and that this will be sustained in the future.

6.4.49 After assessing the potential impacts of the Proposed Development (incorporating embedded mitigation), all attempts were made to further avoid and minimise predicted adverse ecological impacts and restore damaged habitats. Once these mitigation measures had been incorporated, assessment of the residual impacts was undertaken to determine the likely significance of their effects on important ecological features.

6.4.50 The key mitigation hierarchy principles of NPF4 and EcIA (CIEEM, 2018) have all been considered and/or used through the design process of the Proposed Development.

*Cumulative Effects*

6.4.51 Cumulative effects could result from individually relatively minor but collectively relatively moderate/major impacts taking place over a period of time or concentrated in a location. Cumulative effects are particularly important in EcIA as ecological features may be already exposed to background levels of threat or pressure and may be close to critical thresholds where further impact could cause further or irreversible decline. Cumulative effects can also make habitats and species more vulnerable or sensitive to change (CIEEM, 2018).

6.4.52 There is no published NatureScot guidance for cumulative impact assessment on most ecological receptors. NatureScot's guidance on cumulative impact assessment of onshore wind farms is confined to landscape and birds. The key principle of NatureScot's cumulative impact assessment guidance for birds is to focus on any or significant effects and in particular those that are likely to influence the outcome of the consenting process. Therefore, it follows that cumulative ecological impact should be considered on any impacts with likely significant effects, i.e. those likely to affect FCS.

**Difficulties and Uncertainties**

6.4.53 The level of certainty of impact prediction varies depending upon a range of parameters. For some elements e.g. land-take it is relatively straightforward to assess and quantify the area of habitat that is likely to be lost to development infrastructure and therefore quantify potential impacts of land-take on the habitats present. However, other impacts are less certain because there can be a range of possible scenarios. The main limitations in this assessment are common to most ecological assessments because:

- Baseline surveys undertaken are based on sampling techniques, not absolute censuses. Results give an indication of the numbers of ecological receptors recorded at the particular times that surveys were carried out. Species occurrence changes over time and therefore the results presented in this EIAR are snapshots in time. Importantly, no information gaps were identified in the baseline survey data that would prevent assessments in line with the requirements of the EIA Regulations to be undertaken.
- Putting ecology survey results into a wider geographical context is sometimes challenging because most species and habitats have not been systematically surveyed beyond the two Study Areas. Thus, defining a receptor population as locally or regionally important is potentially difficult because local or regional population estimates do not exist for many taxa and habitats. Whenever such uncertainty exists, professional judgement and published evidence is used and populations in the two Study Areas or Site have been assumed to be at their highest potential level of geographical/ecological importance.

6.4.54 Where there is uncertainty, this is identified and reported transparently, along with the measures taken to reduce it, assumptions made, and an explanation as to the extent that any uncertainties are likely to affect the conclusions. In circumstances where there is uncertainty; evidence, expert opinion, best practice guidance and professional judgement have been used to evaluate what is biologically likely to occur if the Proposed Development is constructed. Where assumptions within the assessment are made, these are explicitly identified and explained. Similarly, limitations in methods and knowledge of

species' ecology are also identified and discussed, particularly where this is likely to affect the outcome of the assessment.

6.4.55 Within these constraints, the baseline data collected has allowed a robust and thorough assessment of potential effects. Further account of limitations, where relevant to each appendix, is provided in **Appendices 6.1** to **6.10** and **6.16** and **6.17**.

6.4.56 Whilst some information gaps have been identified, it is considered that there is sufficient information to enable an informed decision to be taken in relation to the identification and assessment of likely significant effects on ecological receptors.

## 6.5 Existing Environment

6.5.1 The existing environment within the Turbine Study Area was that of low, rugged hills, scattered with small outcrops of rocks and scoured with steep sided streams. There was open moorland, predominantly upland heath and mires including bog pools, on the higher ground and a mixture of rough grassland and woodland on the lower slopes.

6.5.2 The baseline conditions within the Study Areas, i.e. those at the time of the submission of the application for consent for the Proposed Development, includes the existence of the current operational Beinn Ghlas Wind Farm which is proposed to be decommissioned either in parallel with or prior to the construction of the Proposed Development (**Chapter 2**).

### Desk Study – Designated Sites

6.5.3 A total of nine statutory designated sites were identified in the Designated Site Search Area (10 km radius of the Turbine Study Area) (**Table 6.6**; **Volume 3a, Figure 6.2**). One of these statutory designated sites is for geological features. Therefore, a total of eight statutory designated sites with ecological features are within the Designated Site Search Area.

6.5.4 The closest designated site is the Glen Nant section of the Loch Etive Woods SAC and SSSI. It is designated for upland oak woodlands and associated invertebrate, bryophyte and lichen assemblages. It also forms the Glen Nant National Nature Reserve. It is c. 1.6 km of the Turbine Study Area.

6.5.5 In addition, the Airds Park and Coille Nathais SSSI, which is part of the Loch Etive Woods SAC, is c. 100 m east of the Site Access Study Area and designated for marsh fritillary and upland oak woodland (**Volume 3a, Figure 6.2**).

**Table 6.6: Statutory designated sites within the Designated Site Search Area.**

| Name | Designation | Size | Features of Interest | Distance (km) and direction from Turbine Study Area | Distance (km) and direction from Site Access Study Area |
|---|---|---|---|---|---|
| Loch Etive Woods | SAC | 2,642.5 ha | Alder woodland on floodplains;<br>Mixed woodland on base-rich soils associated with rocky slopes;<br>Western acidic oak woodland; &<br>Otters. | 1.6 km, east | 0.1 km, east |
| Glen Etive and Glen Fyne | SPA | 81,372.5 ha | Breeding golden eagles. | 5.9 km, northeast | 5.5 km, east |
| Bonawe to Cadderlie | SSSI | 890.8 ha | Geological. | 6.8 km, northeast | 5.2 km, northeast |
| Clais Dhearg | SSSI | 839.3 ha | Dragonfly assemblage;<br>Marsh fritillary butterfly;<br>Oligotrophic loch;<br>Open water transition fen; &<br>Upland oak woodland. | 4.3 km, northwest | 1.4 km, west |
| Coille Leitire | SSSI | 97.5 ha | Upland oak woodland. | 8.2 km, east | 8.7 km, east |
| Glen Nant | SSSI | 502.0 ha | Bryophyte assemblage;<br>Cranefly;<br>Lichen assemblage; &<br>Upland oak woodland. | 1.6 km, east | 0.9 km, east |
| Kennacraig and Esragan Burn | SSSI | 172.7 ha | Upland oak woodland. | 6.9 km, north | 3.5 km, north |
| Airds Park and Coille Nathais | SSSI | 356.5 ha | Marsh fritillary butterfly; & Upland oak woodland. | 3.2 km, north | 0.1 km, east |
| Barran Dubh | SSSI | 83.2 ha | Bryophyte assemblage. | 7.6 km, northeast | 6.5 km, northeast |
| Loch Creran | SAC | 1226.5ha | Reefs, including marine mammals. | >10km, north | 9.1km, north |

### Desk Study – Species and Habitats

6.5.6 Further details of the desk study are provided in **Volume 4, Technical Appendix 6.1**, which make reference to the previous Beinn Ghlas Wind Farm Environmental Statement as well as freely available data sources (e.g. National Biodiversity Network Atlas). The desk study demonstrated that there are a large number of records of species of potential interest within the vicinity of the Site, including legally protected, SBL and locally important species although most of these were not recorded in the Turbine Study Area, but within the 2 km buffer. The only SBL species identified in the desk study with records in the Turbine Study Area is the large heath butterfly. **Table 6.7** summarises the results of the desk study for species with potential ecological importance for the two Study Areas.

**Table 6.7: Summary of species identified in the desk study with potential ecological importance**

| Species name | Common name | Taxa | Listing |
|---|---|---|---|
| Spilosoma lubricipeda | White ermine | Insect | SBL |
| Ecliptopera silaceata | Small phoenix | Insect | SBL |
| Entephria caesiata | Grey mountain carpet | Insect | SBL |
| Xanthorhoe ferrugata | Dark-barred twin-spot carpet | Insect | SBL |
| Apamea remissa | Dusky brocade | Insect | SBL |
| Diarsia rubi | Small square-spot | Insect | SBL |
| Orthosia gracilis | Powdered quaker | Insect | SBL |
| Coenonympha pamphilus | Small heath | Insect | SBL |
| Eugnorisma glareosa | Autumnal rustic | Insect | SBL |
| Hydraecia micacea | Rosy rustic | Insect | SBL |
| Acronicta rumicis | Knot grass | Insect | SBL |
| Boloria selene | Small pearl-bordered fritillary | Insect | SBL |
| Trichopteryx polycommata | Barred tooth-striped | Insect | SBL |
| Anguilla anguilla | Eel | Fish | SBL |
| Salmo salar | Atlantic salmon | Fish | SBL |
| Salmo trutta | Brown/sea trout | Fish | SBL |
| Felis silvestris | Wildcat | Mammal | SBL, EPS |
| Lutra lutra | Otter | Mammal | SBL, EPS |
| Martes martes | Pine marten | Mammal | SBL |
| Mustela putorius | Polecat | Mammal | SBL |
| Lepus timidus | Mountain hare | Mammal | SBL |
| Sciurus vulgaris | Red squirrel | Mammal | SBL |
| Bufo bufo | Common toad | Amphibian | SBL |
| Anguis fragilis | Slow-worm | Reptile | SBL |
| Zootoca vivipara | Common lizard | Reptile | SBL |
| Hypotrachyna endochlora | | Fungi | SBL |

| Species name | Common name | Taxa | Listing |
|---|---|---|---|
| Hypotrachyna sinuosa | | Fungi | SBL |
| Menegazzia terebrata | | Fungi | SBL |
| Leptogium brebissonii | | Fungi | SBL |
| Leptogium burgessii | | Fungi | SBL |
| Lobaria pulmonaria | Lungwort lichen | Fungi | SBL |
| Sticta limbata | | Fungi | SBL |
| Sticta sylvatica | | Fungi | SBL |
| Pannaria conoplea | | Fungi | SBL |
| Pannaria rubiginosa | | Fungi | SBL |
| Peltigera collina | | Fungi | SBL |
| Bryum cyclophyllum | Round-leaved bryum | Moss | SBL |
| Ditrichum flexicaule | | Moss | SBL |
| Hedwigia ciliata | | Moss | SBL |
| Dichodontium flavescens | Yellowish forkmoss | Moss | SBL |
| Saxifraga hypnoides | Mossy saxifrage | Plant | SBL |
| Juniperus communis | Juniper | Plant | SBL |
| Nephroma laevigatum | | Lichen | SBL |
| Micarea alabastrites | | Lichen | SBL |
| *Hammarbya paludosa* | Bog orchid | Plant | Nationally scarce |
| *Erebia aethiops* | Scotch argus butterfly | Invertebrate | Nationally scarce |
| *Carabus nitens* | Shining ground beetle | Invertebrate | Nationally scarce |
| *Entephria flavicinclata* | Yellow ringed carpet moth | Invertebrate | Nationally scarce |
| *Colostygia olivata* | Beech-green carpet moth | Invertebrate | Locally scarce |
| *Carsia sororiata* | Manchester treble-bar moth | Invertebrate | Nationally scarce |
| *Coenonympha tullia* | Large heath butterfly | Invertebrate | SBL |

### Habitat Surveys

6.5.7 Further details of the methods and results of the Phase 1 Habitat and NVC for the Turbine Study Area surveys can be found in **Volume 4, Technical Appendix 6.2** and **Volume 3a, Figure 6.3a**. A PCA was conducted for the Turbine Study Area and details can be found in **Volume 4, Technical Appendix 6.3** and **Volume 3a, Figure 6.4**. Habitat surveys for the Site Access Study Area are reported in **Volume 4, Technical Appendix 6.4** and **Volume 3a, Figure 6.3b**. To comply with CIEEM guidance on the age of ecological data, a walkover survey was conducted in March 2025 to identify if there were any substantive changes in habitats since the original survey were undertaken. This is reported in **Volume 4, Technical Appendix 6.16**.

6.5.8 GWDTE were considered, and details provided in **Technical Appendix 6.2, 6.3** and **6.4** and **Volume 3a, Figures 6.5a, 6.5b and 6.5c**. The results of the habitat surveys are summarised below.

*Phase 1 Habitat and NVC for the Turbine Study Area*

6.5.9 A variety of habitats characteristic of upland sites were recorded within the Turbine Study Area (**Table 6.8**). The terrain comprised a complex of steep-sided hills and valleys with a few flatter patches of bogs or marshy grassland, with several scattered small lochs and lochans. The vegetation comprised mostly of a mosaic of wet heath and bogs, interspersed with areas of acid and marshy grassland. The very steep and rocky slopes supported a mosaic of dry heath and acid grassland. Several watercourses were present across the site, a few of which were flanked by small remnants of deciduous woodland and willow scrub.

6.5.10 The vegetation communities present were characteristic of dry and wet upland habitats, including some that are likely to comprise groundwater dependent terrestrial ecosystems. Varying levels of grazing pressure by sheep and deer was evident throughout, which in some localities was likely to be resulting in the degradation of the vegetation communities present.

6.5.11 The NVC communities recorded included:

- H10 – *Calluna vulgaris – Erica cinerea* heath, typical sub-community;
- M15 – *Trichophorum germanicum – Erica tetralix* wet heath, no assigned subcommunity;
- M17a – *Trichophorum germanicum – Eriophorum vaginatum* mire, *Drosera rotundifolia – Sphagnum* spp. sub-community;
- M19b – *Calluna vulgaris – Eriophorum vaginatum* mire, *Empetrum nigrum* ssp *nigrum* subcommunity;
- M25a – *Molinia caerulea – Potentilla erecta* mire, *Erica tetralix* sub-community;
- M6 – *Carex echinata – Sphagnum fallax/denticulatum* mire: no sub-community assigned;
- M11 – *Carex demissa – Saxifraga aizoides* mire;
- M37 – *Palustriella commutate – Festuca rubra* spring;
- M23a – *Juncus effusus/acutiflorus – Galium palustre* rush pasture, *Juncus acutiflorus* subcommunity;
- S9 – *Carex rostrata* swamp;
- U4 – *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland: no sub-community assigned;
- U5d – *Nardus stricta – Galium saxatile* grassland, *Calluna vulgaris-Danthonia decumbens* sub-community;
- U6a – *Juncus squarrosus – Festuca ovina* grassland, *Sphagnum* sub-community
- W1 – *Salix cinerea – Galium palustre* woodland; and
- W9 – *Fraxinus excelsior – Sorbus aucuparia – Mercurialis* perennis woodland, no subcommunity assigned.

6.5.12 The walkover survey conducted in March 2025 did not identify any substantive changes in habitats since the original survey were undertaken (**Technical Appendix 6.16)**.

**Table 6.8: Broad habitat categories (Blanket Bog, Wet Heath, Wet Heath/Blanket Bog, Other Habitat Type), with the Phase 1 Habitat and NVC communities and the area (in ha) of the Turbine Study Area (from Avian Ecology, 2022).** Bold denotes the name and area metric (ha) of the broad/main habitat types.

| Main Phase 1 Habitat | Phase 1 Habitat | NVC communities | Area (ha) |
|---|---|---|---|
| **Blanket bog** | | | **59.6** |
| | Blanket bog | M17a | 25.9 |
| | Blanket bog/wet modified bog | M17a/M25a(15%) | 2.7 |
| | Blanket bog/acid grassland | M17a/U6a | 4.1 |
| | Blanket bog | M19b | 1.3 |
| | Blanket bog | M19b/M17a | 16.6 |
| | Blanket bog/acid grassland | M19b/U4/U6a | 5.6 |
| | Blanket bog/wet modified bog | M25a(20%)/M17a | 1.5 |
| | Blanket bog/wet modified bog | M25a/M17a/M15 | 1.9 |
| **Wet heath** | | | **137.5** |
| | Wet heath | M15 | 21.3 |
| | Wet heath/dry heath/acid grassland | M15/H10a/U4/U5d | 31.9 |
| | Wet heath/dry heath/acid grassland | M15/H10a/U4/U5d/U6a | 23.7 |
| | Wet heath/dry heath/acid grassland | M15/H10a/U5d/U4 | 3.3 |
| | Wet heath/acid grassland | M15/U4 | 3.6 |
| | Wet heath/acid grassland | M15/U4(20%)/U5d(10%) | 13.7 |
| | Wet heath/acid grassland | M15/U4/U5d | 1.2 |
| | Wet heath/acid grassland/marshy grassland | M15/U4/U5d/M23a | 7.5 |
| | Wet heath/acid grassland | M15/U5d | 16.9 |
| | Wet heath/acid grassland | M15/U5d(20%) | 1.1 |
| | Wet heath/acid grassland | M15/U5d/U4 | 3.4 |
| | Wet heath/acid grassland | M15/U5d/U6a | 5.6 |

| Main Phase 1 Habitat | Phase 1 Habitat | NVC communities | Area (ha) |
|---|---|---|---|
| | Wet heath/acid grassland | M15/U6a | 4.1 |
| **Wet heath/blanket bog mosaics** | | | **484.4** |
| | Wet heath/blanket bog | M15/M17a | 64.5 |
| | Wet heath/blanket bog/acid grassland | M15/M17a(15%)/U4(10%) | 7.1 |
| | Wet heath/blanket bog | M15/M17a(20%) | 5.5 |
| | Wet heath/blanket bog/acid grassland | M15/M17a(20%)/U4(10%)/U5d(5%) | 13.9 |
| | Wet heath/blanket bog | M15/M17a(40%) | 67.0 |
| | Wet heath/blanket bog/acid grassland | M15/M17a(50%)/U5d(15%)/U6a(5%) | 105.4 |
| | Wet heath/blanket bog/acid grassland | M15/M17a/U4(10%)/U5d(10%) | 120.0 |
| | Wet heath/blanket bog/acid grassland | M15/M17a/U5d | 14.7 |
| | Wet heath/blanket bog/acid grassland | M15/U5d/M17a | 7.4 |
| | Wet heath/blanket bog/acid grassland | M17a/M15/U5d/U4 | 61.8 |
| | Wet heath/blanket bog/acid grassland | M19b(60%)/M15/U5d/U6a | 12.0 |
| | Wet modified bog wet heath/blanket bog | M25/M17a/M15(10%) | 5.1 |
| **Building/Roads** | Building/road | Building/road | 0.04 |
| **Dry heath** | | | **58.49** |
| | Dry heath | H10a | 0.16 |
| | Dry heath/acid grassland | H10a/U4 | 58.33 |
| | Hardstanding | Hardstanding | 6.14 |
| **Marshy grassland** | | | **25.55** |
| | Marshy grassland | M23a | 20.99 |
| | Marshy grassland/swamp | M23a/S9 | 4.56 |
| | Standing water | Standing water | 2.90 |
| **Acid grassland** | | | **4.79** |

| Main Phase 1 Habitat | Phase 1 Habitat | NVC communities | Area (ha) |
|---|---|---|---|
| | Acid grassland | U4 | 0.97 |
| | Acid grassland | U4/U5d | 1.40 |
| | Acid grassland | U5d/U6a | 0.80 |
| | Acid grassland | U6a | 1.57 |
| | Acid grassland | Unassigned (U4) | 0.05 |
| **Scrub** | | | **2.34** |
| | Scrub/dry heath | Unassigned (W9/H10a) | 0.24 |
| | Scrub | W1 | 0.24 |
| | Scrub | W9 | 0.42 |
| | Scrub/dry heath/acid grassland | W9/H10a/U4 | 1.44 |
| ***Total*** | | | ***781.8*** |

*Phase 1 Habitat and NVC for the Site Access Study Area*

6.5.13 Further details of the habitat survey and assessment for the Site Access Study Area can be found in **Technical Appendix 6.4** and **6.16** and **Volume 3a, Figures 6.3b** and **6.5b**.

6.5.14 The Site Access Study Area was characterised by habitats common to the west of Scotland including coniferous plantation, felled plantation and semi-natural broadleaved woodland (NVC communities W4, W7, W11, W14). There were areas of acid grassland (NVC communities U4 and U5), marshy grassland (NVC community MG10a), neutral grassland (NVC community MG9), dry heath (NVC community H10a) and bracken (NVC community U20). There were small amounts of other habitats within the Site Access Study Area including scrub (NVC communities W1, W23), tall ruderal vegetation (NVC community OV27) and the introduced shrub, rhododendron.

6.5.15 **Table 6.9** displays the full list of Phase 1 Habitats mapped and the total estimated area of each habitat type found within the Site Access Study Area.

**Table 6.9: Total area and percentage of Phase 1 Habitats (and where relevant NVC community) found in the Site Access Study Area**

| Phase 1 Habitat (NVC community) | Area (ha) | % of Study Area |
|---|---|---|
| **Semi-natural broadleaved woodland** | **37.5** | **25.1** |
| W11 | 18.6 | 12.4 |
| W11:W1 | 0.4 | 0.3 |
| W11:W7:W4 | 5.5 | 3.7 |
| W14 | 0.1 | 0.1 |
| W4 | 1.2 | 0.8 |
| W4:W7 | 2.0 | 1.3 |
| W7:U20 | 0.2 | 0.1 |
| W7:W11 | 9.6 | 6.4 |
| **Coniferous plantation** | **54.3** | **36.3** |
| **Felled plantation** | **8.9** | **6.0** |
| **Unimproved acid grassland** | **13.1** | **8.8** |
| U5 | 0.3 | 0.2 |
| U5:MG10a | 6.8 | 4.6 |
| U5:MG10a:MG9 | 0.8 | 0.5 |
| U5:MG10a:U20 | 5.2 | 3.5 |
| **Semi-improved acid grassland** | **8.0** | **5.3** |
| U4 | 4.9 | 3.3 |
| U4:MG10a | 1.5 | 1.0 |
| U4:MG10a:U20:Track | 1.7 | 1.1 |
| **Neutral grassland, MG9** | **2.8** | **1.9** |
| **Marshy grassland** | **8.1** | **5.4** |
| MG10a | 2.8 | 1.9 |
| MG10a:MG9:U20 | 0.4 | 0.2 |

| Phase 1 Habitat (NVC community) | Area (ha) | % of Study Area |
|---|---|---|
| MG10a:U5:U20 | 2.6 | 1.7 |
| MG10a:U5:U4:U20 | 2.4 | 1.6 |
| **Bracken** | **5.6** | **3.7** |
| U20 | 2.1 | 1.4 |
| U20:birch regen | 0.2 | 0.2 |
| U20:MG10a:U5 | 1.5 | 1.0 |
| U20:U5 | 1.4 | 1.0 |
| U20:W11 | 0.4 | 0.2 |
| **Dry heath** | **1.2** | **0.8** |
| H10a | 0.8 | 0.5 |
| H10a: birch regen | 0.4 | 0.3 |
| **Introduced scrub** | **0.1** | **0.1** |
| **Buildings, tracks etc** | **7.3** | **4.8** |
| Building | 0.5 | 0.3 |
| Car park:W23:U5:U20:OV27:W11 | 0.8 | 0.6 |
| Track | 5.8 | 3.9 |
| Works area | 0.2 | 0.1 |
| **Private land** | **2.8** | **1.8** |
| *Total* | *149.7* | *100.0* |

6.5.16 The walkover survey conducted in March 2025 did not identify any substantive changes in habitats in the Site Access Study Area since the original survey were undertaken (**Technical Appendix 6.16)**.

*Peatland Condition Assessment*

6.5.17 Further details of the PCA survey and assessment can be found in **Technical Appendix 6.3** and **6.16** and **Volume 3a, Figure 6.4**.

6.5.18 The PCA survey identified that the Turbine Study Area contained complex terrain with peatland habitats, namely blanket bog, in valley bases and on shallow slopes.

6.5.19 All the blanket bog within the Turbine Study Area had been subject to some degree of modification e.g. through climate change and nitrogen deposition, historic burning and drainage and extensive grazing pressure was noted across the Turbine Study Area. The condition of the blanket bog habitat was variable and was on a continuum from very wet bog exhibiting characteristics of Near-Natural blanket bog to highly Modified and Actively Eroding areas.

6.5.20 **Table 6.10** gives the condition of the peatland recorded within the Turbine Study Area according to the PCA categories with additional categories used to separate clear variation of the Modified category which was seen within the Study Area.

**Table 6.10: Total area and percentage of PCA category in the Turbine Study Area**

| PCA Category | Area (Ha) | % of Study Area |
|---|---|---|
| Near-Natural | 9.2 | 1.1 |
| Lightly Modified | 70.7 | 8.8 |
| Modified | 459.8 | 57.0 |
| Actively Eroding | 6.2 | 0.8 |
| Recovering Erosion | 1.5 | 0.2 |
| Not blanket bog habitat | 258.7 | 32.1 |
| Total | 806.1 | 100 |

6.5.21 The walkover survey conducted in March 2025 did not identify any substantive changes in peatland condition since the original survey were undertaken (**Technical Appendix 6.16)**.

*GWDTE*

6.5.22 Further details of the GWDTE survey and assessment can be found in **Technical Appendix 6.2, 6.3, 6.4, 6.14** and **Volume 3a, Figures 6.5**. GWDTE are protected under the Water Framework Directive. BGS hydrogeological mapping identifies that the geology underlying the two Study Areas was considered to be a low productivity aquifer with groundwater only present in near surface weathered zone and secondary fractures (British Geological Society (BGS), 2023). Therefore, there is limited potential for the presence of actual GWDTE within the three Study Areas.

6.5.23 NVC communities recorded in the two Study Areas that are considered in the guidance (SEPA, 2017a; SEPA, 2017b) to be potentially groundwater dependent include:

- M6 – *Carex echinata – Sphagnum fallax* mire;
- M11 – *Carex demissa – Saxifraga aizoides* mire;
- M15 – *Trichophorum germanicum – Erica tetralix* wet dwarf-shrub heath;
- M23 – *Juncus effusus/acutiflorus – Galium palustre* rush-pasture;
- M25 – *Molinia caerulea – Potentilla erecta* mire;
- M37 – *Palustruella commutate-Festuca rubra* spring;
- U6 – *Juncus squarrousus – Festuca ovina* grassland;
- W1 – *Salix cinerea – Galium palustre* scrub community;
- W4 – *Betula pendula – Molinia caerulea* woodland;
- W7 – *Alnus glutinosa – Fraxinus excelsior – Lysimachia nemorum* woodland;
- MG9 – *Holcus lanatus – Deschampsia cespitosa* grassland; and
- MG10 – *Holcus lanatus – Juncus effusus* rush-pasture.

6.5.24 Of these, M6, M11, M23, M37, W4 and W7 are considered to be potentially highly groundwater dependent, depending on the hydrological setting (SEPA, 2017a; SEPA, 2017b). The other communities are considered potentially moderately groundwater dependent, depending on the hydrological setting (SEPA, 2017a; SEPA, 2017b).

6.5.25 The small flushes of M6 and M11 and the spring heads, M37, were considered likely to be highly groundwater dependent.

6.5.26 Some communities, such as W4 and W7 were generally located along watercourses, and whilst may have some groundwater influence, surface water influences may also sustain them.

6.5.27 Much of the other potential GWDTE occurred as part of the ombrotrophic peatland bog system and their presence is considered to generally be related to the presence of waterlogged conditions sustained in the surrounding peatland bog system. As such, many of the communities were considered likely to be reliant on direct rainfall and limited drainage within the peatbog system, rather than groundwater, for their maintenance. GWDTE are considered further in **Chapter 8**.

**Plants**

6.5.28 Further details of the plant species identified during habitat surveys are provided in **Technical Appendices 6.2 - 6.4** and **6.14**.

6.5.29 The SBL is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. None of the plant species recorded in the two Study Area on the SBL.

6.5.30 Rhododendron is a non-native invasive species identified within the Site Access Study Area. It was located as a planted hedge near Am Barr and occasional small individuals were recorded along the Fearnoch Forest track. No other non-native invasive species were recorded in the Site Access Study Area or Turbine Study Area. However, this does not preclude them from being present in the future or their presence in an un-vegetative/unidentifiable state during surveys.

**Habitat Walkover Survey Update, 2025**

6.5.31 A walkover habitat survey was undertaken in March 2025 to comply with CIEEM guidance on the age of ecological data. No substantive changes in habitats were recorded since the original survey were undertaken (**Technical Appendix 6.16**).

**Protected Terrestrial Mammals**

6.5.32 Details of the protected terrestrial mammal surveys conducted are provided in **Volume 4, Technical Appendix 6.5, Volume 3a, Figures 6.6a** and **6.6b**. The following evidence of protected terrestrial mammals was identified.

- A single pine marten scat was recorded at the southern side of the Turbine Study Area. Seven pine marten scats were recorded along the Site Access Study Area.
- Badger scat was recorded in one location along the Site Access Study Area.
- Otter spraints were recorded on Allt na Creiche and Allt na Crionaiche Bige. A regularly used otter run and sprainting site was recorded crossing the proposed Site Access Study Area.
- A few mature broadleaved trees with bat roost potential were recorded along the Site Access Study Area.
- Numerous foraging signs of red squirrels were present within the conifer plantation along the Site Access Study Area and at least two live animals were seen.
- Burrows which could have been water vole (although note, not confirmed) were recorded in small numbers and low densities within the Turbine Study Area.
- No evidence of wildcat was recorded within the Turbine Study Area.

6.5.33 Although there is no evidence that would suggest the Study Areas are particularly important for any protected terrestrial mammal species, there is evidence of some use by otter, pine marten, badger, red squirrel and potentially water vole (**Technical Appendix 6.5, Volume 3a, Figures 6.6a** and **6.6b**).

**Mammal Walkover Survey Updated, 2025**

6.5.34 To comply with CIEEM guidance on the age of ecological data, a walkover survey was conducted in March 2025 to identify if there were any substantive changes in the Study Areas use by protected terrestrial mammals since the original surveys were undertaken. This is reported in **Volume 4, Technical Appendix 6.17** and no substance changes were recorded in mammal use, with limited signs recorded:

- No badger signs were recorded.
- A low number of otter spraints were recorded. The regularly used otter run was still clearly active.
- No active water vole signs were recorded.
- A low number of pine marten scats were recorded along the access track.

**Invertebrates**

6.5.35 Whilst not a protected species, a large number of woodant nests, likely to be Scottish woodant were recorded along Site Access Study Area during protected terrestrial mammal surveys. Further details are provided in **Technical Appendix 6.5**.

**Bats**

6.5.36 Further details of the bat surveys are provided in **Volume 4, Technical Appendix 6.6** for the Turbine Study Area.

6.5.37 Surveys recorded four bat species: common pipistrelle, soprano pipistrelle, Daubenton's and brown long-eared bats. With all locations where static detectors were deployed taken into consideration, a total of 500 nights recording were made. There was a total of 111 bat passes recorded throughout this survey period (i.e. 500 nights). The majority of these were common and soprano pipistrelle, with a small number of Daubenton's and brown long-eared passes recorded.

6.5.38 Given the results from desk study and bat activity surveys, there was evidence that the Turbine Study Area was used by very small numbers of primarily common and soprano pipistrelle, though also some Daubenton's and brown long-eared were also recorded.

6.5.39 The overall potential risk of the Proposed Development to bats was assessed, following standard guidance, as 'low' for all bat species recorded.

6.5.40 No specific bat surveys were conducted in the Site Access Study Area.

**Fish Habitat**

6.5.41 Details of the fish habitat survey methodology and results are provided in **Volume 4, Technical Appendix 6.7** for the Turbine Study Area. A qualitative walkover survey of stream habitats was carried out in June 2022, focusing on suitability of the habitat for trout. The surveys found that:

- Most of the surveyed watercourses were small and steep with relatively little flow and offered poor habitat for fish.
- Good trout habitat was found in the Laggan Burn in the east of the Site, and in the lower reaches of Eas Ruadh in the southwest of the Site.
- Trout were seen in Laggan Burn and Eas Ruadh and some of their tributaries. No trout or other fish species were seen in other surveyed watercourses.

6.5.42 No specific fish habitat surveys were conducted in the Site Access Study Area.

**Freshwater Pearl Mussels**

6.5.43 Details of the freshwater pearl mussel survey methodology and results are provided in **Volume 4, Technical Appendix 6.8**. The lower-mid reaches of the Garbh Allt and the unnamed burn flowing out of Loch Bealach an Fhiodhain were surveyed for freshwater pearl mussels in March 2022 and November 2023 by a team of highly experienced, licensed surveyors (Licence No: 123301 and 217698). Surveys were conducted during a suitable weather when the water levels were low-moderate and turbidity low/clear and the weather bright providing optimal surveying conditions.

6.5.44 No live or dead freshwater pearl mussels were recorded in the lower-mid reaches of the Garbh Allt or the unnamed burn flowing out of Loch Bealach an Fhiodhain and no substantial areas of suitable in-stream substrate habitats were present either.

6.5.45 No specific freshwater pearl surveys were conducted in the Site Access Study Area.

**Determining Importance**

6.5.46 Based on the results of the desk study, initial site-walkover, previous knowledge of the Site of the original Beinn Ghlas Wind Farm, field surveys, scoping comments, legal protection and professional judgement, the following potentially important receptors were identified for further consideration:

- designated sites;
- badger;
- otter;
- pine marten;
- red squirrel;
- bats; and
- semi-natural habitats.

6.5.47 Other species (such as those identified in the desk study, cited as part of nearby designated areas with similar habitats to the two Study Areas or present in the Argyll and Bute LBAP), were mainly scoped out of further consideration on the basis of:

- survey results;
- habitats within the two Study Areas compared to the species' preferred habitat; and
- the population size of the potentially important species on a geographical basis.

6.5.48 **Table 6.11** summarises the evaluation of potentially important receptor population/feature within the two Study Areas.

**Table 6.11 – Summary evaluation of potentially important ecological receptors.**

| Potentially Important Receptor | Evaluation of Potentially Important Receptor Population/Feature within the two Study Areas |
|---|---|
| Designated sites | Internationally important designated sites within 2 km (Loch Etive Woods SAC). Nationally important designated sites present within 2 km (e.g. Glen Nant and Airds Park and Coille Nathais SSSI).<br>All the other terrestrial designated sites are >2 km away from the Proposed Development. Therefore, no land-take or changes to hydrology would take place within these designated sites, so no direct or indirect habitat loss would occur. No other route to impact on terrestrial designated sites or their features is predicted. Consequently, no likely significant effects on these other designated sites and their ecological features are predicted and so they have been scoped out from further consideration. |
| Badger | Badgers are a common and widespread legally protected species. A single badger scat was recorded in one location along the Site Access Study Area. No evidence of any badger setts was recorded. Badgers are considered to be of local importance within the two Study Areas and to have low sensitivity to human disturbance. Status: Least Concern in Scotland, GB population estimate 562,000 individuals (Mammal Society, 2018). Scottish population estimate 115,000 individuals (Mathews *et al*., 2018). |
| Pine marten | Pine martens are a relatively common and widespread legally protected species. A single pine marten scat was recorded at the southern side of the Turbine Study Area. Seven pine marten scats were recorded along the Site Access Study Area. Therefore, pine marten are considered occasionally present. Pine martens are considered to be of local importance in the two Study Areas and to have moderate sensitivity to human activities/disturbance. Status: Least Concern in Scotland, GB and Scottish population estimate 1,600-8,900 individuals (Mammal Society, 2018; Mathews *et al*., 2018). |
| Otter | Legally protected species which now generally considered relatively common and widespread in Scotland. Nationally and internationally important population in the nearby Loch Etive Woods SAC. Small numbers of otter signs e.g. spraints and a well-used run within the Turbine Study Area in 2022-2023. No other evidence of protected otter features, such as holts or couches were recorded. This suggests that whilst otters use the two Study Areas occasionally it was not necessarily important for them. Otters are considered to be of local importance in the two Study Areas and to have moderate-high sensitivity to human activities, with resting places and holts considered highly sensitive. Status: Vulnerable in Scotland, GB population estimate unknown (Mammal Society, 2018). |
| Water vole | Legally protected species. Potential water vole burrows were recorded in two locations within the Turbine Study Area. However, there was no evidence of recent use by water vole. Assuming the burrows were water vole burrows (not confirmed), the evidence suggests that while water voles may have previously been present within the Turbine Study Area, it is not an area with a large or permanent population. Due to the variable occupancy of the Turbine Study Area by water voles and the apparent low population size, water voles are considered to be of local importance within the Turbine Study Area when present. Water voles are considered to have low sensitivity to human disturbance. Status: Near-threatened in Scotland, GB population estimate 99,000-329,000 individuals (Mammal Society, 2018). Scottish population estimate c. 50,000 individuals (Mathews *et al*., 2018).<br>Given that there was no evidence of current water vole occupation of the Site, and the nearest potential water vole burrow was c. 400 m from the nearest infrastructure water vole have been scoped out from any further assessment. Nevertheless, as water voles are legally protected and their populations vary geographically between years pre-construction surveys will be conducted around proposed work areas in potentially suitable habitats before any construction work commences so that potential annual use, which varies, can be considered. An ECoW will also inspect the riparian habitat prior to any construction work commences. In additional, a watching brief will also be kept for this species. |

| Potentially Important Receptor | Evaluation of Potentially Important Receptor Population/Feature within the two Study Areas |
|---|---|
| | Construction workers will be given toolbox talks to provide information with regard to water voles.<br>If recent water vole activity is located, 10 m work exclusion zones will be marked as per NatureScot standing guidance. If a 10 m exclusion zone is not possible around any active water vole burrows a licence will be required from NatureScot before works can proceed. |
| Wildcat | Legally protected species. There was no evidence of wildcat occurrence within the two Study Areas. Status: Critically Endangered in Scotland, Scotland population estimate 30-430 individuals (Mammal Society, 2018). Scoped out of further consideration as no evidence of occurrence but note recommendation for watching brief for protected mammals during the construction phase. |
| Red squirrel | Legally protected species. Numerous foraging signs of red squirrels were present within the conifer plantation along the Site Access Study Area and at least two live animals were seen. Likely dreys present in woodland habitats. It should be assumed that red squirrel is omnipresent within the conifer forest part of the Site Access Study Area, and potentially present in any woodland in the two Study Areas. Red squirrel is considered to be of local importance and to be moderately sensitive to human disturbance. Status: Near-threatened in Scotland, GB population estimate 287,000 individuals (Mammal Society, 2018). Scottish population estimate c. 239,000 individuals (Mathews *et al.,* 2018). |
| Bats | Four legally protected species of bat were recorded within the Turbine Study Area. No roost sites were recorded. Status:<br>Daubenton's bat: Least Concern. UK estimated population of c. 0.03-4.4 million (mean est. c. 1 million) individuals (The Mammal Society, 2018). Scottish population estimate c. 6,220-1.0 million (mean population est. c. 0.2 million) individuals (Mathews *et al*., 2018).<br>Common pipistrelle bat. Least Concern. UK estimated population of between c. 0.9-7.5 million (mean population est. c. 3 million) individuals (The Mammal Society, 2018). Scottish population estimate c. 0.3-2.2 million (mean population est. c. 0.9 million) individuals (Mathews *et al.,* 2018).<br>Soprano pipistrelle bat. Least Concern. UK population estimated population of between c. 2-8.5 million (mean est. c. 4.6 million) individuals (The Mammal Society, 2018). Scottish population estimate c. 0.35-2.1 million (mean population est. c. 1.2 million) individuals (Mathews *et al.,* 2018).<br>Brown long-eared bats. Least Concern. UK population estimated population of c. 934,000 individuals (The Mammal Society, 2018). Scottish population estimate c. 230,000 individuals (Mathews *et al*., 2018).<br>Low levels of bat activity was recorded within the Turbine Study Area. Bats are considered likely to be present in the Site Access Study Area. Bat populations within the two Study Areas are considered to be of local importance. Bats are considered to have low sensitivity to human disturbance. |
| Freshwater pearl mussel | Legally protected species. Status: Listed as Critically Endangered in Europe by IUCN. Scotland population declining; known to be extinct in 73 watercourses, not successfully recruiting in 44 watercourses and evidence of recent successful recruitment in 71 watercourses (Cosgrove *et al.,* 2016). No live or dead freshwater pearl mussels were recorded in any watercourses and no substantial areas of potentially suitable in-stream habitats were present either. Therefore, freshwater pearl mussels have been scoped out of further assessment. |
| Fish Habitat & fish populations | The streams in the Turbine Study Area are not accessible to migratory fish (salmon or sea trout). Most of the surveyed streams were small and steep with relatively little flow, and offered poor habitat for fish, with exception of Laggan Burn in the east of the Site, and in the lower reaches of Eas Ruadh in the southwest of the Site, where good trout habitat was present. The trout populations, where present, are considered to be of local importance and to be moderately-highly sensitive to water quality/quantity change. Therefore, fish and fish habitats have been scoped out of further assessment, based on |

| Potentially Important Receptor | Evaluation of Potentially Important Receptor Population/Feature within the two Study Areas |
|---|---|
| | assumptions surrounding effective implementation of embedded best practice pollution prevention measures and the avoidance of any instream works. Obstruction to upstream and downstream migration of fish will not take place and all relevant watercourse crossing designs will ensure fish passage is possible at stream crossings. Monitoring should follow the outline of recommendations in **Technical Appendix 6.7**. |
| Macro-invertebrate | Baseline data for freshwater macro-invertebrate is generally only used for monitoring water quality and establishing baseline conditions (unless rare/legally protected species are known to be present). Given that much of the Site is too steep to be productive for fish and that many of the streams are tiny first-order headwaters these receptors have been scoped out of further consideration within the EIAR. Should consent be granted for the Proposed Development then baseline aquatic monitoring would be established following standardised methodologies in accordance with best practice guidance. |
| Habitats | Local, regionally, nationally and internationally important habitats present in Argyll and Bute. The quantity/quality of semi-natural habitats evaluated as locally important, except for the blanket bog and bog pools some of which are evaluated as part of the nationally important resource and some of the semi-natural broadleaved woodland which is in or nearby/contiguous with the Loch Etive Woods SAC and Glen Naut SSSI, designated for oak woodlands and consequently has been assessed as regionally important, except when it forms part of the designated site where it is nationally/internationally important. For further details see **Technical Appendix 6.12.** |
| GWDTE | Potentially important GWDTE habitats present in the vicinity of the two Study Areas. All the potential GWDTE were assessed as not being actual GWDTE except for the M6, M11 and M37. See **Chapter 9** for further details. |
| Woodant | The Scottish woodant is not legally protected and not on the SBL. It's IUCN status is classified as: 'Near Threatened'. Whilst there were no targeted surveys for woodants, surveys of the Site Access Study Area in January-February 2023 recorded numerous woodant nests, likely Scottish woodant within 50 m of either side of the existing track within the conifer forest. No woodant nests were recorded in the Turbine Study Area.<br>It is considered unlikely that woodants would be significantly adversely impacted though the Proposed Development because:<br>• other than a potentially small (negligible) land-take of possible habitat, no significant impacts are considered likely from the Proposed Development on this species;<br>• the Site Access Study Area is not specially designated for these species, or habitats which support these species, rather the woodant nests are located within a commercial coniferous woodland; and<br>• any other potential very small impacts are unlikely to increase form the baseline of being located within a commercial coniferous woodland.<br>Therefore, woodants have been scoped out of further assessment. However, to avoid any (non-significant) adverse impacts on woodants an ECoW will undertake a woodant nest survey in the suitable habitat that would be impacted by the development (specifically any existing track widening), prior to construction and all woodant nests that could be directly impacted will be moved using best practice guidance for translocation of woodant nests. |
| Reptiles | Reptiles are typically widespread, with low-moderate abundance in the Scottish Uplands. Species such as adders and common lizards are SBL species and common across the UK (NBN Atlas, 2023).<br>The Scoping document the following statement was made : "*reptile surveys are considered unnecessary for this Proposed Development. It will be assumed that there is a low number of reptiles in the suitable habitat across the Study Area. In light of these findings, reptiles will not be subject to further consideration within the EIAR*." |

| Potentially Important Receptor | Evaluation of Potentially Important Receptor Population/Feature within the two Study Areas |
|---|---|
| | Whilst there were no targeted surveys for reptiles, common lizards were occasionally seen, and it is likely there are locally important populations across the Turbine Study Area. Given the lack of evidence of any particular ecological sensitivity and NatureScot's agreement with the scope of ecological surveys (Table 6.1) reptiles they have been scoped out of further assessment. |
| Large heath butterfly | Widespread and common in the Scottish uplands and across Highland (Barbour *et al.*, 2008). Range declining (Asher *et al.,* 2001). SBL species. Previous surveys demonstrated that it was widespread across the Turbine Study Area habitats. The population in the Turbine Study Area is considered locally important. It is considered to have low sensitivity to human disturbance. There was no evidence of large heath in the Site Access Study Area where habitat for large heath would be very limited and so important populations of large heath would be unlikely.<br>It is considered unlikely that this common and widespread species would be significantly adversely impacted though the Proposed Development because:<br>• other than a potentially small (negligible) land-take of possible habitat, no significant impacts are considered likely from the Proposed Development on this species or habitats which support this species;<br>• the Turbine Study Area is not specially designated for these species, or habitats which support these species; and<br>• any other potential very small impacts are unlikely to increase form the baseline of being located near an existing operational wind farm.<br>Therefore, large heath has been scoped out of further assessment. |
| Dragonflies and damselflies | Whilst no targeted surveys were conducted for dragonflies and damselflies it is considered likely that the limited number of Turbine Study Area pools present support some Odonata species. There were no pools recorded in the Site Access Study Area and so important populations of Odonata species are unlikely.<br>It is considered unlikely that any Odonata species would be significantly adversely impacted though the Proposed Development because the bog pool habitats where they are found have been avoided by design. Therefore, dragonflies and damselflies have been scoped out of further assessment. Furthermore, the planned peatland restoration work, particularly increasing the number of pools, planned as part of the OBE-HMP, would likely benefit many of these species and indeed the design of them will be specially tailored towards localised upland Odonata species. |
| Other Butterflies and moths | Whilst no targeted surveys were conducted for butterflies and moths, upland habitats generally can support moderate assemblage of these species and so it is considered likely there are several species present in the two Study Areas.<br>It is considered unlikely that butterflies and moths would be significantly adversely impacted though the Proposed Development because:<br>• other than a potentially small (negligible) land-take of possible habitat, no significant impacts are considered likely from the Proposed Development on Lepidoptera species or habitats which support Lepidoptera.<br>• the Study Areas are not specially designated for these species, or habitats which support these species; and<br>• any other potential very small impacts are unlikely to increase form the baseline of being located near an existing operational wind farm/tracks etc.<br>Therefore, butterflies and moths have been scoped out of further assessment. However, the planned peatland restoration work and nature network restoration work, planned as part of the OBE-HMP, would likely benefit many Lepidoptera. |

## 6.6 Embedded Mitigation

### Design Considerations

6.6.1 In line with NPF4 and best practice guidance (CIEEM, 2018), an iterative design approach has been taken and the Proposed Development was designed to avoid or minimise sensitive and legally protected ecological receptors, as far as possible within the parameters of the project. As such, mitigation has been embedded within the project design and so will be guaranteed to take place for the lifetime of the Proposed Development through planning conditions.

*Avoidance*

6.6.2 Avoidance of potentially important ecological receptors has been achieved in several areas by the proposed design. For example:

- Careful consideration of sensitive habitats was undertaken throughout the design process. It was recommended in **Technical Appendix 6.3** that all blanket bog habitat identified as being in or approaching Near-Natural conditions should be avoided and impacts should be minimised on all blanket bog and likely GWDTE habitats.
- All the blanket bog identified as being in or approaching Near-Natural conditions was avoided by design as far as possible.
- The design iteration included the removal of 4 turbines, resulting in a reduction of impacts on habitats including bog habitats.
- Several turbines were relocated to less sensitive positions based on ecological evidence. For example, T03 was moved from an area adjacent to Near-Natural blanket bog to an area of grassland and less sensitive bog habitat and T06 was likewise moved out of more sensitive blanket bog habitat. For further details see **Volume 4, Technical Appendix 6.9** and **Chapter 2**.
- Track and other infrastructure have been re-positioned to avoid more sensitive areas. For example, the track to T01 was rerouted to avoid a GWDTE and to avoid the more sensitive bog habitat.
- T01 was repositioned to avoid bog pools that would have been impacted by the crane pad. See **Chapter 2** for further details.
- As far as possible, the design layout uses the existing wind farm tracks and forestry tracks, thereby avoiding creating many wholly new and unnecessary tracks.
- Remnants of riparian woodland habitat within the Turbine Study Area have been avoided by design.
- Most highly GWDTE including flushes and springs have been avoided by design (see **Chapter 8** for further details).

*Minimisation*

Where avoidance was not possible, potential impacts have been minimised in the following ways:

- To minimise impacts on areas with deep peat and blanket bog habitat, floating tracks would be used wherever possible. See **Chapter 2** for further details.
- Where possible, existing tracks have been identified for widening, rather than the unnecessary creation of lengthy new sections of tracks.

**Best Practice Measures**

6.6.3 In line with NPF4 and best practice guidance (e.g. CIEEM, 2018), best practice measures would be undertaken to further avoid or minimise potential impacts on ecological receptors.

*Avoidance*

- Exposed pipe systems will be capped when contractors are off site, and exposed trenches or holes will be covered or exit ramps provided to prevent protected mammals becoming trapped.
- Any security lighting will be directed away from the sensitive mammal areas.
- Chemicals will be stored in a safe and secure place following best practice guidance.
- Mammal friendly designs (with appropriate mammal ledges to provide routes for mammals to pass through) will be used for large culverts and bridges to provide safe access and crossing points.
- Mammal friendly fencing will be used to avoid blocking potential routes (they will have regular small gaps for mammals to move through).
- Watercourse crossings will not block fish passage and will be 'fish friendly' in those with fish populations.
- Watercourses have a minimal stand-off distance of 50 m.

*Minimisation*

6.6.4 Minimisation of impacts on ecological receptors has been achieved in several areas by the proposed design. For example:

- Pre-construction surveys will be undertaken for protected terrestrial mammals. A watching brief will also be kept for these species. Construction workers will be given toolbox talks to provide information with regard to these species.
- Species protection plans (SPP) will be developed for badger, otter, red squirrel, pine marten and water vole (as needed).
- Work exclusion zones to be identified wherever necessary.
- There will be full implementation of best practice pollution prevention measures.
- There will be full implementation of a suitable Construction Environmental Management Plan (CEMP), which will include measures for minimising disruption to groundwater flow, suitable surface water drainage and SuDS.
- Low vehicle speed limits (15 mph) will be imposed during operation and construction to reduce the likelihood of injury or mortality of protected terrestrial mammals.
- Otter crossing road signs will be located at watercourse crossings and particularly at the otter crossing point identified along the Site Access to further help prevent vehicle traffic mortality during operation.
- The topsoil/acrotelm will be preserved where possible, from habitat that is lost. It will be laid over the top of the areas to be reinstated (e.g. so called 'cut and fill' areas) or used in habitat restoration (for details see **Chapter 8**).
- An ECoW will undertake a woodant nest survey in the suitable habitat that would be impacted by the development, prior to construction, and all woodant nests that would be directly impacted will be moved using best practice guidance for translocating woodant nests.

- Water quality, macro-invertebrate and fish baseline surveys will be undertaken priory to construction commencing.
- Bat roost and red squirrel drey surveys will be undertaken prior to any tree felling (unknown at the time of writing), and under the direction of bat and red squirrel protection plans. If necessary, this will include felling trees out with the breeding season for red squirrel (e.g. outwith February to September).

*Restore*

6.6.5 Restoring of damaged habitats by the Proposed Development would be achieved through the full implementation of the measures in **Chapter 2** and the Outline Peat Management Plan (**Technical Appendix 8.3**).

## 6.7 Predicted Effects

### Impacts to be Assessed

6.7.1 The main construction and operational elements of the Proposed Development which have the potential to impact on ecological receptors both during construction and operation are assessed within this section. For further details of the Proposed Development refer to **Chapter 2**. A summary of the potential construction and operational impacts on ecology are outlined in **Table 6.12** and **Table 6.13**. Potential impacts are identified in these tables but do not imply that they would necessarily occur, or that any resultant effects would be significant.

**Table 6.12: Summary of potential construction impacts on ecological receptors**

| Term | Potential Construction Impacts |
|---|---|
| Mobile plant operations and traffic | Direct habitat loss. Temporary noise. Vibration, movement, vegetation disturbance and habitat fragmentation. Pollution and sediment release into watercourses. Mortality. |
| Tracks and watercourse crossings including cut/fill works | Direct habitat loss. Temporary noise. Vibration, movement, vegetation disturbance and habitat fragmentation. Pollution and sediment release into watercourses. Changes in hydrology and chemistry leading to vegetation changes and potential blocking of fish passage. Mortality. |
| Cable laying including cut/fill works | Direct habitat loss. Temporary noise. Vibration, movement, vegetation disturbance and habitat fragmentation. Pollution and sediment release into watercourses. Introduction of drainage lines leading to habitat change. |
| Turbine foundations, Construction compounds and laydown areas including cut/fill works | Direct habitat loss. Temporary habitat loss, disturbance and fragmentation caused by overlaying vegetation. Pollution and sediment release into watercourses. Mortality. |

**Table 6.13 – Summary of potential operational impacts on ecological receptors**

| Term | Potential Operational Impacts |
|---|---|
| Turbines in operation | Noise and movement resulting in potential disturbance or mortality. |
| Foundations | Smaller residual loss of habitat from construction throughout operation. Impacts on hydrology resulting in changes to vegetation. |

| Term | Potential Operational Impacts |
|---|---|
| Tracks | Loss of habitat from construction throughout operation, severance and fragmentation of both terrestrial and aquatic habitats. Impacts on hydrology and chemistry along track edges resulting in changes to vegetation. Sediment release into watercourses. Mortality from service vehicles. |
| Recreation i.e. recreational use of tracks | Increased disturbance and associated effects through noise and trampling etc. e.g. motorbikes, walking, dogs and litter. |
| Substation | Loss of habitat throughout operation. |
| Cleared areas around turbines | Loss of habitat throughout operation. |

**Effects on Designated Sites**

6.7.2 There are ten designated sites with ecological features within the Designated Site Search Area, as identified in **Table 6.6**. The closest and most relevant was the Glen Nant SSSI and the Airds Park and Coille Nathais SSSI, which are both part of the Loch Etive Woods SAC designated for marsh fritillary butterfly and upland oak woodland. Through design avoidance measures, no direct land-take will take place from the Glen Nant SSSI or Airds Park and Coille Nathais (SSSI, and component part of the SAC) so no direct habitat loss of the designated site will occur.

6.7.3 The closest turbine to Glen Nant (SSSI, and component part of the SAC) is Turbine 1, located c. 1.7 km from the boundary. Glen Nant SSSI is separated from the Development Footprint by a large coniferous plantation and open moorland. Therefore, no adverse land-take impact on Glen Nant SSSI is predicted. The OBE-HMP (**Volume 4, Technical Appendix 6.10**) identifies deer management as a key objective, reducing grazing pressure across the peatland habitats for a sustained period of time which will likely have benefits for the adjacent Glen Nant (SSSI, and component part of the SAC). An additional objective of the OBE-HMP is for expansion of the woodland and woodland networks which will also provide minor-moderate benefits to the Glen Nant (SSSI, and component part of the SAC).

6.7.4 The closest section of infrastructure to Airds Park and Coille Nathais (SSSI, and component part of the SAC) is the Site Access, located c. 180 m from the boundary. Airds Park and Coille Nathais SSSI is separated from the Site Access by a coniferous plantation and a watercourse. Therefore, no adverse direct land-take impact on Airds Park and Coille Nathais SSSI. Nevertheless 180 m is relatively close and particular care of e.g. pollution prevention will be required whilst working in this area. An additional objective of the OBE-HMP is for expansion of the woodland and woodland networks which will also provide minor-moderate benefits to the Glen Etive Wood SAC.

6.7.5 The conservation status of designated features for the nearby designated sites are shown in **Table 6.14** (data from NatureScot Sitelink, December 2023).

**Table 6.14: Condition of designated features within the nearby designated sites**

| Designated site | Designated feature | Latest assessed condition | Adverse pressures identified |
|---|---|---|---|
| Glen Nant | Upland oak woodland | Unfavourable. No change. 15 Feb 2007. | Forestry operations. Invasive species - sitka spruce |
| | A cranefly (*Tipula luridorostris*) | Favourable Maintained. 20 Mar 2017. | No negative pressures. |
| | Bryophyte assemblage | Favourable Maintained. 23 Feb 2015 | Under grazing. |
| | Lichen assemblage | Unfavourable. No change. 20 Feb 2019. | Invasive species. Maintenance activities - over grazing from deer. |
| Airds Park and Coille Nathais SSSI | Upland oak woodland | Unfavourable. Recovering. 27 Mar 2019. | Over grazing. |
| | Marsh fritillary butterfly | Unfavourable. Declining. 21 Nov 2014. | Forestry operations. Invasive species. Under grazing. |
| Loch Etive Woods SAC | Alder woodland on floodplains | Unfavourable. Recovering. 31 Mar 2005. | Over grazing. |
| | Mixed woodland on base-rich soils associated with rocky slopes | Favourable. Declining. 23 Mar 2020. | Invasive species - rhododendron and sitka spruce. Over grazing from deer. |
| | Otter | Favourable. Maintained. 17 Aug 2016. | Forestry operations. |
| | Western acidic oak woodland | Unfavourable. Recovering. 31 Mar 2005. | Over grazing. |

6.7.6 To assess whether impacts or associated activities of the Proposed Development, are likely to undermine the conservation objectives of Glen Nant SSSI, Airds Park and Coille Nathais SSSI and Loch Etive Woods SAC, each conservation objective for each site are considered in turn in **Table 6.15** (conservation objectives taken from Glen Nant SSSI Site Management Statement, 2010; Airds Park and Coille Nathais SSSI Site Management Statement, 2010 and Loch Etive Woods Conservation Advice Package, 2005). This includes considering if there are likely to be impacts on the condition, or the conservation status of the species or habitats for which sites are designated on.

6.7.7 As there will be no direct land-take from any designated sites, there will be no direct loss to the upland oak woodland, or any other qualifying habitats and so these features will not be directly impacted (**Table 6.15**). Therefore, no likely significant direct adverse land-take effects are predicted for any of the designated sites.

6.7.8 Hydrological impacts and pollution pathways are considered in **Chapter 8** which takes account of standard mitigation, in particular implementation of a suitable CEMP which will include measures for minimising disruption to groundwater flow and appropriate storage and management of fuels and chemicals. No likely impacts on ecological processes or the structure and function of the designated sites have been identified. Consequently, no likely significant indirect or direct effects are predicted for any of the designated sites.

6.7.9 Otters within Loch Etive Woods SAC being mobile have the potential to be impacted by the Proposed Development, through for example, mortality, fragmentation, changes in population dynamics, changes to their food web and from pollution events. For further details see species specific assessment for otter (**Section 6.8**). In summary, the conditions required to support the population of otter is unlikely to be substantially impacted by the Proposed Development and the viability of the designated site otter population is unlikely to be changed by the Proposed Development (**Table 6.15**).

6.7.10 There may be some temporary noise disturbance from the construction and operation of the Proposed Development on otters in the Airds Park and Coille Nathais SSSI section of Loch Etive Woods SAC, where the Site Access is in within c. 180 m of the designated site boundary. The construction work is estimated to extend over an approximate 23-month period, but the section of Site Access near Airds Park and Coille Nathais SSSI is already a forestry track, and the construction of this section would be less than c. 3 months. There is dense coniferous plantation between the Site Access and the designated site in this section. Disturbance to important otter locations within the designated site is therefore likely to be negligible. The magnitude of impact to otters as a consequence of potential disturbance from the construction and operation of the Proposed Development is assessed as negligible. The impact to otters within Loch Etive Woods SAC as a consequence of potential disturbance from construction and operation of the Proposed Development is considered to be unlikely, intermittent, and reversible for construction and operation. Consequently, no likely significant effects are predicted. Nevertheless, a pre-construction otter survey is recommended as a planning condition to ensure the identification and protection of any resting/lie-up/holt features that might be used in the intervening period between that last otter survey and construction commencing.

**Table 6.15: Assessment summary of impacts of the Proposed Development on the designated site(s) Conservation Objectives**

| Designated site | Conservation Objective | Consideration of Potential Impacts (Including Extent, Nature, Function, Population Size and Viability) | Does the Proposed Development Undermine Conservation Objective or Status? | Predicted Impacts |
|---|---|---|---|---|
| Glen Nant SSSI | Maintain and enhance the extent and distribution of upland oak woodland habitat. | For details see habitat specific account (**Section 6.8**).<br>There will be no change to the extent or distribution of the upland oak woodland habitat in Glen Nant SSSI as a result of the Proposed Development as there is no land-take from Glen Nant. There will be no direct loss to the upland oak woodland habitat. The condition of the upland oak woodland habitat will not be adversely impacted by the Proposed Development (e.g. no hydrological pathway as the SSSI is within a different water catchment/over 1.7 km away from the Turbine Study Area). No pathway for impacting on ecological processes such as colonisation or nutrient cycling has been identified. However, the OBE-HMP (**Technical Appendix 6.10**) includes the improvement of nature networks which would ensure greater landscape connectivity and an overall increase in woodland habitat. | No | Beneficial |
| | Maintain and enhance the diversity and distribution of the bryophyte assemblage. | There will be no direct change to the diversity and distribution of the bryophyte assemblage in Glen Nant SSSI from the Proposed Development. However, reduced grazing pressure through deer management will be an important component of the OBE-HMP (**Technical Appendix 6.10**) and may provide ecological benefits and biodiversity enhancement within the SSSI, including to upland oak woodlands and the improvement of nature networks will ensure greater landscape connectivity and an overall increase in woodland habitat and so may benefit bryophyte assemblage in Glen Nant SSSI. | No | None (potentially beneficial) |
| | Maintain and enhance the diversity and distribution of the lichen assemblage. | There will be no direct change to the diversity and distribution of the lichen assemblage in Glen Nant SSSI from the Proposed Development. However, the OBE-HMP (**Technical Appendix 6.10**) includes the improvement of nature networks which would ensure greater landscape connectivity and an overall increase in woodland habitat and so may benefit lichen assemblage in Glen Nant SSSI. | No | None (potentially positive) |

| Designated site | Conservation Objective | Consideration of Potential Impacts (Including Extent, Nature, Function, Population Size and Viability) | Does the Proposed Development Undermine Conservation Objective or Status? | Predicted Impacts |
|---|---|---|---|---|
| | Maintain and enhance conditions suitable for fly species (*Tipula luridorostris*). | According to the Glen Nant SSSI Citation the rare cranefly *Tipula luridorostris*, larvae lives in moss found on trees in western oak woods where rainfall is relatively high. Glen Nant is one of only three sites from which *Tipula luridorostris* has been recorded in Great Britain since 1970. There will be no change to the extent or distribution of the oak woodland within the Glen Nant SSSI as there is no land-take from the Glen Nant SSSI. | No | None |
| Airds Park and Coille Nathais SSSI | To maintain the extent and distribution of woodland habitats as a fully functioning woodland ecosystem and, where appropriate, enhance the existing woodland habitat. | For details see habitat specific account (**Section 6.8**).<br>There will be no change to the extent or distribution of the upland oak woodland habitat in Airds Park and Coille Nathais SSSI as a result of the Proposed Development as there is no land-take from Airds Park and Coille Nathais. There will be no direct loss to the upland oak woodland habitat. The condition of the upland oak woodland habitat will not be adversely impacted by the Proposed Development (e.g. no hydrological pathway as the SSSI is within a different water catchment). No pathway for impacting on ecological processes such as colonisation or nutrient cycling has been identified. However, the improvement of nature networks as part of the OBE-HMP will ensure greater landscape connectivity and an overall increase in woodland habitat. | No | Beneficial |
| | Maintain open areas of damp grassland with abundant devil's-bit scabious. | There will be no change to the extent or distribution of the damp grassland with abundant devil's-bit scabious in Airds Park and Coille Nathais SSSI as a result of the Proposed Development as there is no land-take from Airds Park and Coille Nathais. However, the improvement of nature networks and as part of the OBE-HMP will ensure greater landscape connectivity and an overall increase in woodland habitat. | No | None |
| Glen Etive Wood SAC | To ensure that the qualifying features of Loch Etive Woods SAC (see Table 6.14) are in favorable condition and make an appropriate | There will be no change to the extent or distribution of the qualifying woodland habitat in the Glen Etive Wood SAC as there is no land-take within the Glen Etive Wood SAC. The integrity of the site will not be adversely altered by the Proposed Development (e.g. no hydrological | No | None (potentially beneficial impacts) |

| Designated site | Conservation Objective | Consideration of Potential Impacts (Including Extent, Nature, Function, Population Size and Viability) | Does the Proposed Development Undermine Conservation Objective or Status? | Predicted Impacts |
|---|---|---|---|---|
| | contribution to achieving favourable conservation status; and | pathway as the SAC is in a different catchment). No pathways for disruption to ecological process (e.g. colonisation, nutrient cycling etc.) have been identified. However, the improvement of nature networks and as part of the OBE-HMP will ensure greater landscape connectivity and an overall increase in woodland habitat and provide ecological benefits and biodiversity enhancement which may extend to the SAC. | | |
| | 2. To ensure that the integrity of Loch Etive Woods SAC is restored by meeting objectives 2a, 2b and 2c for each qualifying feature:<br>2a. Maintain the extent and distribution of the habitat within the site.<br>2b. Maintain the structure, function and supporting processes of the habitat.<br>2c. Maintain the distribution and viability of typical species of the habitat. | There will be no change in the extent of the habitats on the SAC from the Proposed Development.<br>There will be no change in the distribution of the habitats within the SAC from the Proposed Development.<br>The structure and function (e.g. vegetation dynamics such as competition, ecosystem properties such as connectivity or population dynamics) of the habitats in the SAC will not be altered from the Proposed Development. No pathways for disruption of the structure and function of the SAC have been identified.<br>The process supporting the habitats in the SAC will not be altered by the Proposed Development. No pathways for disruption to ecological process (e.g. colonisation, nutrient cycling) have been identified.<br>The distribution of the typical species of the qualifying habitats in the SAC will not be altered from the Proposed Development.<br>There will be no disturbance to the typical species of the habitat within the SAC.<br>Therefore, the conservation status of the SAC qualifying habitats will be maintained. | No | None |

### Effects on Badger, Otter, Pine Marten and Red Squirrel

6.7.11 This section describes the predicted effects on badgers, otter, pine martens and red squirrel that could arise, from the construction and operation of the Proposed Development. Embedded mitigation, including avoidance and minimisation to reduce potential effects have been described (**Section 6.6**).

6.7.12 The construction and operation of the Proposed Development has the potential to adversely affect badgers, otter, pine martens and red squirrel directly or indirectly in a number of ways:

- physical damage or loss of setts, holts, dens, feeding or resting sites or foraging habitat from construction;
- damage/destruction of routes potentially used by badgers, otters, pine martens or squirrels while crossing the two Study Areas (severance);
- damage to watercourses by runoff, pollution and blocking of streams that are used by otter;
- disturbance caused by noise of construction or operational of proposed development; and
- direct injury or mortality.

6.7.13 **Technical Appendix 6.5** provides details of legal protection as well as the baseline surveys for badgers, otters, pine marten and red squirrels for the Turbine Study Area and the Site Access Study Area. There was also a walkover survey for protected terrestrial mammals in 2025 (**Technical Appendix 6.17**). In summary:

- Badgers are a legally protected species. Badgers are considered to be of local importance within the Site Access Study Area and to have low sensitivity to human disturbance. Baseline surveys suggest that while badgers are present within the Site Access Study Area, that it is not in constant use or particularly important for badger (i.e. no setts recorded). There was no evidence of badgers in the Turbine Study Area although occasional use is possible.
- Otters are a legally protected species. The population of otters using the Turbine Study Area and the Site Access Study Area is considered of local importance, although may be functionally linked to the nearby nationally and international important population that is designated in the Glen Etive Woods SAC. Otters are considered to have moderate-high sensitivity to human activities, with resting places and holts considered particularly highly sensitive. Although there was some evidence of otter use, the low amount of evidence recorded suggests that Turbine Study Area and the Site Access Study Area were not particularly important for them, except the regularly used sprainting site and run at NM 97508 29160.
- Pine martens are considered to be of local importance in the Turbine Study Area and the Site Access Study Area and to have moderate sensitivity to human activities/disturbance. Pine marten are considered to be occasionally present within the Turbine Study Area and the Site Access Study Area but they are not in constant use or particularly important for pine marten (localised Site Access Study Area signs notwithstanding) (**Technical Appendix 6.5**).
- Red squirrel is a legally protected species. Red squirrels are considered to be of local importance. They are considered to have moderate sensitivity to human activities/disturbance. Baseline surveys suggests that while the conifer forest part of the Site Access Study Area in Fearnoch Forest is important for red squirrel, the remainder of the Site Access Study Area and the Turbine Study Area is not.

*Physical damage or loss of setts, holts, dens, dreys or resting sites from construction*

6.7.14 No badger setts, otter holts, natal holt or other otter resting sites or pine marten dens were recorded during targeted surveys. Therefore, no direct loss of any of these features are predicted from construction. Consequently, the magnitude of impact arising from the loss resting sites (land-take) from the Proposed Development on badgers, otters and pine marten is assessed as negligible (**Table 6.16**).

6.7.15 Nevertheless, mammal activity changes within and between seasons and individuals. A pre-construction protected terrestrial mammal survey will be undertaken prior to construction commencing. If a new badger sett, otter holt or resting site or pine marten den is located, expert advice will be sought and works will likely require a licence from NatureScot before they can proceed unless suitable exclusion zones can be maintained (as per NatureScot's standing guidance).

6.7.16 No red squirrel dreys were specifically recorded during targeted surveys, however their presence was not discounted as there were many thousands of trees in the conifer plantation along the Site Access Study Area with the potential to have a squirrel drey. Due to the proposed widening of the access road running through Fearnoch Forest to accommodate the delivery of abnormal loads from the anticipated port of entry, the Proposed Development will impact upon a moderate area (approximately 5 ha of semi-natural woodland and 4 ha of coniferous plantation) of woodland resulting in the felling of up to 1.61 ha of trees.

6.7.17 Recent Scottish studies have investigated forest management activities, specifically tree felling and thinning on red squirrel breeding activity, survival, population density and home range use (e.g. de Raad *et al.,* 2021). The results show that red squirrel survival was relatively high compared to sites without forest operations and breeding activity continued with no detectable impact of forest operations. Indeed, red squirrel population density was higher after thinning operations took place. Whilst space use changed for a handful of individuals, home ranges and core areas overall did not significantly change in response to thinning operations and such routine forestry activities did not impact on the FCS of red squirrels. Based on this research, there is no evidence to suggest thinning or localised felling (alongside for example the widened of the Site Access) would cause any likely significantly effects on the locally important red squirrel population in Fearnoch Forest.

6.7.18 The areas of forestry that would be affected to facilitate the Proposed Development are shown in **Technical Appendix 13.1.** Forestry impacts and compensatory planting requirements are discussed further in **Chapter 13**. At the time of writing (July 2025), which individual trees may need felling along the Site Access is unknown.

6.7.19 Therefore, a targeted pre-construction survey will be undertaken prior to construction commencing in this area. If a red squirrel drey is located that would be directly impacted by the Proposed Development, a licence from NatureScot would be needed before felling can proceed. Licence conditions may stipulate the time of year felling must take place, e.g. outside of the red squirrel breeding season.

**Table 6.16: Summary of predicted impacts of physical damage or loss to setts, holts, dens, dreys or other important/legally protected resting places within the Study Areas**

| Parameter | Badger | Otter | Pine marten | Red squirel |
|---|---|---|---|---|
| **Positive/negative/ neutral** | Negative | Negative | Negative | Negative |
| **Extent** | Development Footprint | Development Footprint | Development Footprint | Conifer forest section of the Site Access Study Area in Fearnoch Forest |
| **Duration** | Long-term | Long-term | Long-term | Long-term |
| **Reversibility** | Irreversible | Irreversible | Irreversible | Irreversible |
| **Frequency** | One-off/never | One-off/never | One-off/never | One-off/never |
| **Probability** | Unlikely | Unlikely | Unlikely | Likely |
| **Magnitude** | Negligible | Negligible | Negligible | Negligible |

*Physical damage of feeding site or foraging habitat from construction and operation*

6.7.20 Badger activity was considered to be low and occasional across the Study Areas, but they were considered to be occasionally present and could use the habitat for foraging. Badgers are omnivorous, feeding on a wide variety of food from invertebrates, small mammals and birds to plant foods such as fruit, nuts, seeds and crops. A badger scat was found around the greenhouses, buildings and track near Barguillean Farm. The key foraging habitats identified by NatureScot are improved pasture, deciduous woodland, and cereal fields. There were areas of improved pasture and deciduous woodland nearby the scat and so they are likely to use these habitats for foraging. Given the widespread nature of improved pasture and deciduous woodland in parts of the two Study Areas and the relatively very small loss of this habitat type as a result of the Proposed Development, the magnitude of impact arising from the loss of foraging habitat (primarily land-take associated with the creation/widening of the Site Access) on badgers is assessed as negligible. The loss of important foraging habitat is considered to be unlikely, one-off, irreversible and long-term and no likely significant effects are predicted (Table 6.17).

6.7.21 Otter activity was considered to be low and occasional across the Study Areas, but they were considered to be occasionally present and could use the habitat for foraging. Otters are carnivores, feeding on fish, amphibians, crustaceans but also eggs, insects, birds and small mammals. Their preferred habitat (away from the coast) is along watercourses. Given that the Proposed Development has largely avoided riparian habitat, the magnitude of predicted impact arising from the loss of feeding grounds from the Proposed Development on otters is assessed as negligible. The loss of feeding grounds from the Proposed Development is considered to be unlikely, never/one-off, irreversible and long-term and no likely significant effects are predicted (**Table 6.17**).

6.7.22 Pine marten activity was considered to be low and occasional across the Study Areas, but they were considered to be occasionally present and could use the habitat for foraging. Pine martens are omnivorous, feeding on a wide variety of food from large mammal carrion, beetles, small mammals, eggs, and birds to plant foods such as fruit,

nuts, berries and fungi. The majority of the pine marten scat was found on the lower along the Site Access Study Area. Pine marten's preferred habitat is woodland, however, they also use upland open rocky areas in Scotland too. Given the widespread nature of woodland and open habitat in the surroundings and the relatively very small loss of this habitat type as a result of the Proposed Development the magnitude of impact arising from the loss of foraging habitat (land-take) from the Proposed Development on pine marten is assessed as negligible. The loss of foraging habitat is considered to be unlikely, one-off, irreversible and long-term and no likely significant effects are predicted (**Table 6.17**).

6.7.23 Red squirrel activity was considered to be high in the conifer forest section of the Site Access Study Area in Fearnoch Forest. Their activity was considered low and occasional in woodland in other parts of the Site Access Study Area. Red squirrels occur in both coniferous and broadleaved woodland, as well as in mixed woodland, parks and gardens. They eat a wide variety of foods, but tree seeds and fruits are particularly important. Given the widespread occurrence of conifers in Fearnoch Forest and the relatively small loss of this habitat type as a result of the Proposed Development, the magnitude of impact arising from the loss of foraging/breeding habitat (land-take) from the Proposed Development on red squirrel is assessed as negligible/minor (see de Raad *et al.,* 2021). The localised loss of some foraging habitat is considered to be likely, one-off, irreversible and long-term and no likely significant effects are predicted (Table 6.17). The implementation of a Red Squirrel Protection Plan should help to ensure that red squirrel legal protections are properly considered.

**Table 6.17: Summary of predicted impacts of physical damage or loss of foraging habitat from construction and operation within the Study Areas**

| Parameter | Badger | Otter | Pine marten | Red squire |
|---|---|---|---|---|
| **Positive/negative/ neutral** | Negative | Negative | Negative | Negative |
| **Extent** | Development Footprint | Development Footprint | Development Footprint | Conifer forest section of the Site Access Study Area in Fearnoch Forest |
| **Duration** | Long-term | Long-term | Long-term | Long-term |
| **Reversibility** | Irreversible | Irreversible | Irreversible | Irreversible |
| **Frequency** | One-off/never | One-off/never | One-off/never | One-off |
| **Probability** | Unlikely | Unlikely | Unlikely | Likely |
| **Magnitude** | Negligible | Negligible | Negligible | Negligible |

*Severance*

6.7.24 Severance describes the loss of continuity between habitats which ultimately results in the isolation or fragmentation of discrete populations of species and may result in changes to ecological processes such as population dynamics. Table 6.18 considers the potential for severance on badger, otter, pine marten and red squirrel.

6.7.25 The magnitude of potential impact from severance, including to the run/crossing point used by otters, is assessed as negligible. With the embedded mitigation, the impact of severance is considered to be unlikely, never/one-off, reversible and short-term and no likely significant effects are predicted (**Table 6.19**).

**Table 6.18: Potential impacts of severance on badger, otter, pine marten and red squirrel within the Study Areas**

| | Badger | Otter | Pine marten | Red squirrel |
|---|---|---|---|---|
| **Identification of potential severance** | The Proposed Development does not sever or impede access to any important badger habitats. It is considered highly unlikely that a 5.5 m wide road/track would prevent a badger crossing between different areas (roads do not prevent badgers crossing from one side to the other). | The frequently used otter run and crossing point at NM 97508 29160 which was parallel to a small unnamed burn and crossed the proposed Site Access has the potential to be damaged or destroyed during construction.<br>The Proposed Development includes approximately 26 watercourse crossings, of which four are new watercourse crossing (for details see **Chapter 8**). The watercourse crossings have the potential to disrupt otter movements, when they occasionally use the watercourses. In essence, the watercourse crossings or culverts could theoretically act as a barrier to movement between habitats. | The Proposed Development does not sever access to any important pine marten habitats, and it is considered highly unlikely that a 5.5 m wide Site Access would prevent a pine marten crossing between different areas (roads do not prevent pine marten crossing from one side to the other). | The Proposed Development does not sever access to any important red squirrel habitats, and it is considered highly unlikely that a 5.5 m wide road widening would prevent a red squirrel crossing between different areas particularly as there is already an existing forestry track throughout the section of Fearnoch Forest that would be impacted. |
| **Mitigation** | To avoid blocking potential routes, and as part of embedded mitigation, any fencing during construction, operation around Barguillean Farm will be permeable and mammal friendly; in-so-far as they will have regular small gaps for badgers to move through, as advised by the ECoW | The Site Access will likely be reinforced and widened at this location for access. However, the design will be otter friendly and include an otter friendly culvert/bridge at/near to this location. This will provide an alternative, accessible route for otter. Consequently, although work on the track cannot be avoided, the design measures incorporated into plans mean that otters will continue to be able to use the crossing point, as well as having an additional new, alternative route.<br>The route of the otter run will be avoided, through exclusion zones marked on all relevant plans and it will not be entered unnecessarily.<br>Otter crossing road signs will be located at the otter run to alert drivers and help prevent otter traffic mortality. | To avoid blocking potential routes, and as part of embedded mitigation, any fencing during construction, operation will be permeable and mammal friendly. They will be mammal friendly in-so-far as they will have regular small gaps for pine martens to move through, as advised by the ECoW. | No additional mitigation required. |

**Table 6.19: Summary of predicted impacts of severance from construction and operation on badger, otter, pine marten and red squirrel within the Study Areas**

| Parameter | Badger | Severance at otter run | Severance at watercourses | Pine marten | Red squirrel |
|---|---|---|---|---|---|
| **Positive/negative/neutral** | Negative | Negative | Negative | Negative | Negative |
| **Extent** | Development Footprint | At known otter run and crossing | Development Footprint | Development Footprint | Conifer forest section of the Site Access Study Area in Fearnoch Forest |
| **Duration** | Short-term | Short-term | Short-term | Short-term | Short-term |
| **Reversibility** | Reversible | Reversible | Reversible | Reversible | Reversible |
| **Frequency** | One-off/never | One-off | Never/occasional | One-off/never | One-off/never |
| **Probability** | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| **Magnitude** | Negligible | Negligible | Negligible | Negligible | Negligible |

*Damage to watercourses by runoff, pollution and/or blocking of flows*

6.7.26 In the unlikely event that a serious pollution incident occurred within the two Study Areas, a sudden pulse of pollutant, which, if not readily contained, might enter the aquatic environment and could affect otters directly, e.g. by coating fur with oil or indirectly through damage to their prey species. However, taking into account the intended implementation of best practice pollution prevention measures (refer to **Chapter 8**), it is considered highly unlikely that a serious pollution incident would occur during construction and operation. Furthermore, the low levels of otter activity recorded suggests that otters only occasionally use the watercourses within the Study Areas for feeding – regular fresh spraints throughout the year would be expected if the Study Areas were important for foraging or commuting and these were not found. Therefore, in the unlikely event that a pollution incident did occur, it is very doubtful that pollution would substantially affect otter foraging as numerous other unaffected watercourses would be available. The magnitude of potential impact caused by a pollution event for otter is assessed as negligible. With the embedded mitigation, the impact caused by a pollution event is considered to be unlikely, intermittent, reversible and short-term (event), with a medium-term recovery and no likely significant effects are predicted.

*Noise disturbance*

6.7.27 The construction work is estimated to extend over an approximate 23-month period and be concentrated on the high ground away well away from e.g. the section of Site Access that had a nearby badger and pine marten scat, or areas regularly used by otters (e.g. watercourses). Construction and operation disturbance will also be generally away from areas of high red squirrel activity i.e. the conifer forest section of the Site Access Study Area in Fearnoch Forest.

6.7.28 Therefore, the magnitude of impact to badgers, otters, pine marten and red squirrel as a consequence of potential noise disturbance from construction and operation of the Proposed Development is assessed as negligible. The impact of disturbance on badgers,

otters, pine marten and red squirrel is considered to be unlikely, intermittent, reversible and short-term and no likely significant effects are predicted (**Table 6.20**).

*Mortality caused by vehicle traffic*

6.7.29 Vehicular traffic on the Proposed Development site would increase (from pre-construction baselines of occasional vehicles on the existing tracks and argocats across the moorland) during construction and operation and so would mean that individual badgers, otters, pine martens and red squirrels would have a slightly increased possibility (albeit still very small) of being injured or killed by vehicles operating. However, the existing inbuilt design measures such low vehicle speed limits (enforced at 15 mph) would greatly reduce the likelihood of injury or death from happening during construction. Similarly, low vehicle speed limits (15 mph) during operation would greatly reduce the likelihood of any operational mortality. It is assumed that most operational visits would be during daylight hours, avoiding the twilight periods when, for example, badger activity might be expected to increase. Consequently, the likely magnitude of impact of direct vehicular mortality from construction and operation of the Proposed Development on protected terrestrial mammals is assessed as negligible. With the embedded mitigation, the impact of direct mortality on badgers, otters, pine marten and red squirrel from construction and operation of the Proposed Development is considered to be unlikely, intermittent, irreversible and short-term and no likely significant effects are predicted (**Table 6.20**).

**Table 6.20: Summary of predicted impacts of pollution, disturbance and mortality from construction and operation of the Proposed Development on badger, otter, pine marten and red squirrel within the Study Areas**

| Parameter | Pollution | Noise disturbance | Direct mortality |
|---|---|---|---|
| **Positive/negative/ neutral** | Negative | Negative | Negative |
| **Extent** | Watercourses | Site-wide | Development Footprint |
| **Duration** | Short-term (event) medium-term (recovery) | Short-term | Short-term |
| **Reversibility** | Reversible | Reversible | Irreversible (for the individual) reversible (for the population) |
| **Frequency** | Intermittent | Intermittent | Intermittent |
| **Probability** | Unlikely | Unlikely | Unlikely |
| **Magnitude** | Negligible | Negligible | Negligible |

6.7.30 In summary, if the above embedded mitigation measures are implemented, no likely significant effects are predicted for badger, otter, pine marten or red squirrel in relation to the construction and operation of the Proposed Development. However, badgers, otters and pine marten can have large territories and can be highly seasonal/irregular in terms of their use of an area. For example, otters can utilise otherwise unused burns when hunting for frogs and toads or traversing between catchments. Consequently, although there is no evidence that would suggest the Site is important for these species, that does not preclude their occasional use of the two Study Areas and therefore, being legally

protected, pre-construction surveys will be conducted immediately around the Development Footprint before any construction commences. This pre-construction protected species survey is recommended as a planning condition to ensure the identification and protection of any setts, dens or holts that might be used in the intervening period between that last survey and construction commencing.

6.7.31 Red squirrels are highly mobile and known to frequently use the conifer forest section of the Site Access Study Area in Fearnoch Forest. Being legally protected, pre-construction surveys will be conducted immediately around the Development Footprint in this section before any construction commences. This pre-construction protected species survey is recommended as a planning condition to ensure the identification and protection of any dreys that might be present.

6.7.32 In order to prevent (non-significant) adverse impacts on these species (which are legally protected) it is recommended that individual Species Protection Plans are developed and implemented for all stages of the Proposed Development construction. This is recommended as a planning condition.

6.7.33 If the Proposed Development was built, the available information indicates that conservation status of badger, otter, pine marten and red squirrel would not likely be affected because (as articulated in the Habitats Directive):

- These species are likely to maintain themselves on a long-term basis as a viable component of its habitat in the Lorn area.
- The natural range of badger, otter, pine marten and red squirrel in the Lorn area would not be reduced by the Proposed Development, nor would it become likely to be reduced in the foreseeable future.
- There would be (and would continue to be) a sufficiently large habitat area in the Lorn area to maintain the population these species on a long-term basis should the Proposed Development be built.

**Effects on Bats**

6.7.34 This section describes the predicted effects on bats that could arise, from the construction and operation of the Proposed Development. Embedded mitigation, including avoidance and minimisation to reduce potential effects are described.

6.7.35 The construction and operation of the Proposed Development has the potential to adversely affect bats directly or indirectly in a number of ways, for example:

- through habitat loss (land-take);
- loss of roost sites (potentially resulting in mortality);
- through severance or displacement; and
- mortality through direct collision or barotrauma (mortality due to damage to bats' lungs caused by sudden change in air pressure close to the turbine blades).

6.7.36 All bat species are legally protected. The populations of bats using the Study Areas are considered of local importance. Bats are considered to have low sensitivity to human disturbance.

6.7.37 Baseline bat surveys showed low use of the Turbine Study Area by small numbers of four common and widespread species of bat; common pipistrelle, soprano pipistrelle, Daubenton's and brown long-eared bat. No specific bat activity surveys were undertaken

for the Site Access Study Area but given that they use woodlands for foraging it is likely they are present.

6.7.38 Examples of embedded mitigation to avoid and minimise impacts to bats include:

- Avoidance and minimising of impacts on riparian habitat and watercourses, which had a minimum stand-off distance of 50 m.
- New lighting around foraging or commuting corridors, such as watercourses will be avoided or minimised.

*Loss of foraging habitat*

6.7.39 The Turbine Study Area was assessed as having low bat habitat suitability (**Technical Appendix 6.6**). The Development Footprint is on open upland habitat which has limited use by bats and already includes an operational wind farm within it. Bats often use linear features for foraging, such as watercourses and woodland edges. There are 26 access track crossings of riparian habitat (watercourses crossings, see **Chapter 8** for details). However, bats are able to fly unimpeded over bridges and culverts. Bats also use woodland, especially edges, for foraging. Approximately 5 ha [3] of semi-natural broadleaved woodland will be impacted by the Proposed Development. The vast majority of this is along the Site Access through Fearnoch Forest (managed by Forestry Land Scotland), where a track already exists. Therefore, the Site Access will continue to provide edge woodland habitat which can be utilised by bats. Creation of native riparian woodland habitat is included as part of the OBE-HMP (**Technical Appendix 6.10**) and will increase potential bat foraging habitat away from the proposed turbines.

6.7.40 The magnitude of impact arising from the loss of bat habitat from the Proposed Development on bats is assessed as negligible. The loss of bat habitat from the Proposed Development is considered to be unlikely, one-off, irreversible and long-term and no likely significant effects are predicted (**Table 6.22**).

*Loss of roost sites*

6.7.41 The Turbine Study Area was thoroughly surveyed looking for potentially suitable bat roost sites during May 2022. None were recorded. No mature trees with bat roost potential (at the time of surveys), would be required to be felled as part of the Proposed Development. No forestry associated impacts are anticipated from any of the proposed wind turbines onsite, as these are well sited outwith woodland areas. Nevertheless, due to the proposed widening of the access road running through Fearnoch Forest to accommodate the delivery of abnormal loads from the anticipated port of entry, the Proposed Development will impact upon a moderate area (approximately 4 ha (**Volume 4, Technical Appendix 6.12**)) of non-native conifer woodland and a further area of semi-natural woodland (approximately 5 ha in the Site Access Study Area (**Technical Appendix 6.12**)) resulting in the felling of up to 1.61 ha of trees.

6.7.42 The areas of forestry that would be affected to facilitate the Proposed Development are shown in **Technical Appendix 13.1**. Forestry impacts and compensatory planting requirements are discussed further in **Chapter 13**. Pre-construction bat roost potential surveys will be undertaken on any large/old trees scheduled for felling in the Study Areas.

[3] It is noted that the impacts on woodland is likely an overestimate and there is only expected to be felling of 1.61 ha of trees based on the forestry assessment (Chapter 13: Other Issues of the EIA Report).

6.7.43 No adverse impacts would occur on any known bat roosts. The magnitude of impact arising from the loss of roost sites from the Proposed Development on bats is assessed as none. The loss of roost sites from the Proposed Development is considered to be unlikely and no likely significant effects are predicted (**Table 6.21**).

*Severance and displacement*

6.7.44 Severance is the loss of continuity between habitat features. For bats, severance is considered in relation to the loss of continuity of potentially important linear habitat features used for foraging i.e. watercourses and woodland edges (or hedgerows in the case of lowland situations). Displacement of bats could occur if, for example, bats avoided using an important foraging area due to the placement of turbines.

6.7.45 The open, upland Turbine Study Area was assessed as having low bat habitat suitability (**Technical Appendix 6.6**). There was no evidence for important 'hot spots' of bat activity or that the area was used for bat activities such as swarming or commuting (**Technical Appendix 6.6**).

6.7.46 Bats use woodland, especially edges, for foraging. The vast majority of this is along the Site Access as described in section in 6.8.39, where a road already exists. Therefore, the Site Access will continue to provide edge woodland habitat which can be utilised by bats.

6.7.47 The Study Areas watercourses do not have turbines located on or immediately adjacent to them. Watercourses have a minimum stand-off distance of 50 m and bats are able to fly unimpeded over and around other infrastructure. The habitat in which the turbines are situated was defined as having low suitability for bats. Bat activity was recorded as low or none for most nights during bat activity surveys. Therefore, no likely impacts of severance or displacement from the Proposed Development are predicted. Creation of native riparian woodland habitat is included as part of the OBE-HMP (**Technical Appendix 6.10**) which will increase potential bat foraging habitat away from the turbines.

6.7.48 The magnitude of impact from severance or displacement of the Proposed Development on bats is assessed as negligible. Impacts of severance and displacement on bats from the Proposed Development is considered to be unlikely, one-off/never, irreversible and long-term and no likely significant effects are predicted (**Table 6.21**).

*Mortality from collision and barotrauma*

6.7.49 There is uncertainty regarding the likely impact of wind farms killing bats through direct collision with turbines and through barotrauma. NatureScot guidance (e.g. SNH *et al*., 2021) recommends consideration of the inherent risk for different bat species, the habitat suitability, the size of the proposal and the bat activity level recorded during surveys and provides an objective assessment of the potential risk to bats of a wind farm site. Further details are provided in **Technical Appendix 6.6**.

6.7.50 Following the 2021 guidance (SNH *et al*.,) the overall potential site risk level for the Proposed Development was assessed as low-medium. This took into consideration the size of the Proposed Development (note that the number of turbines has been reduced from 12 to 7 since **Technical Appendix 6.6** was written) and low habitat risk. For example: the lack of nearby potential roost sites and the generally low-quality foraging habitat (namely open, upland blanket bog and wet heath around planned turbines), proximity to the existing wind farm and avoidance of turbines near main linear

watercourse features. Those linear features that are present, are small and tend to disappear into the ground rather than run continuously through the Turbine Study Area to another location or run from large headwater lochs. Furthermore, the Turbine Study Area is relatively high altitude, open aspect and windy with prolonged periods of (often very) low temperatures in winter, spring and autumn. Further details are provided in **Technical Appendix 6.6**.

6.7.51 The assessment of potential risk for each bat species recorded in the Turbine Study Area is considered separately.

**Common pipistrelle**

6.7.52 Common pipistrelle is considered to be a common species in Scotland and is generally considered to be inherently susceptible to a high risk of collision with wind turbines (SNH *et al*., 2021).

6.7.53 Bat activity in the Turbine Study Area was considered through static bat detectors. Static bat detectors were deployed across the Turbine Study Area for a total of 41 nights (covering spring, summer and autumn), with 13 static bat detectors recording on each night. A total of 50 passes by common pipistrelle bats were recorded during the whole survey period (early, mid and late-season). This was considered to be a low number of bat passes for this common and well researched species.

6.7.54 The number of common pipistrelle passes recorded was relatively evenly spread across the Turbine Study Area. The maximum number of passes recorded across the entire Turbine Study Area in one night, was only 13 passes.

6.7.55 More than half of the records of common pipistrelle passes were during the mid-season (35 out of 50 bat passes). The additional nights the detectors were recording for in that period, plus the warm weather during this period could contribute to this result. It should be noted that it is not possible to definitively identify individual bats using the bat detectors only the number of bat passes. Bats usually fly back and forth over an area, and so the number of bat passes is unlikely to reflect the number of individual bats.

6.7.56 It was assessed that common pipistrelle had a low overall activity level within the Turbine Study Area.

6.7.57 An assessment of potential risk of the Proposed Development on common pipistrelle was undertaken following best practice guidance (SNH *et al.,* 2021). Despite common pipistrelle being considered to have an inherently high potential risk of collision/barotrauma with turbines, the Proposed Development represents a low overall risk to common pipistrelle bats due to their recorded low activity level across the Turbine Study Area and the low overall habitat risk (further details are provided in **Technical Appendix 6.6**). Note that the reduced number of turbines (from 12 to 7) would likely pose a reduced risk to that which was assessed originally assessed.

6.7.58 The magnitude of impact on common pipistrelle from potential mortality from the Proposed Development is assessed as negligible. Impacts of mortality from collision/barotrauma is considered to be unlikely, but potentially occasional throughout the operational life-time of the wind farm (c. 35 years) and no likely significant effects are predicted (**Table 6.21**).

### Soprano pipistrelle

6.7.59 Soprano pipistrelle is considered to be a common species in Scotland and are generally considered to be inherently susceptible to a high risk of collision with wind turbines (SNH *et al*., 2021).

6.7.60 A total of 44 passes by soprano pipistrelle bats were recorded during the whole survey period (early, mid and late-season). This was considered to be a low number of bat passes for this common and well researched species.

6.7.61 The number of soprano pipistrelle passes recorded was relatively evenly spread across the Turbine Study Area. The maximum number of passes recorded across the entire Turbine Study Area in one night, was only 8 passes. Around half of the records of soprano pipistrelle passes were during the mid-season (23 out of 44 bat passes). The additional nights the detectors were recording for, plus the warm weather during this period could both contribute to this result.

6.7.62 It was assessed that soprano pipistrelle had a low overall activity level within the Turbine Study Area.

6.7.63 An assessment of potential risk of the Proposed Development of soprano pipistrelle was undertaken following best practice guidance (SNH *et al.,* 2021). Despite soprano pipistrelle being inherently susceptible to a high potential risk of collision/barotrauma with turbines, the Proposed Development represents a low overall risk to soprano pipistrelle bats due to their low activity level across the Turbine Study Area and the low overall habitat risk (further details are provided in **Technical Appendix 6.6**). Note that the reduced number of turbines (from 12 to 7) would likely pose a reduced risk to that which was assessed originally assessed.

6.7.64 The magnitude of impact on soprano pipistrelle from potential mortality from the Proposed Development is assessed as negligible. Impacts of mortality from collision/barotrauma is considered to be unlikely, but potentially occasional throughout the operational lifetime of the wind farm (c. 35 years) and no likely significant effects are predicted (**Table 6.21**).

### Daubenton's bat

6.7.65 Daubenton's bat is considered to be a less common species in Scotland compared to the two pipistrelle species and is generally considered to have an inherently low susceptibility of collision with wind turbines (SNH *et al.,* 2019).

6.7.66 A total of 14 passes by Daubenton's bat were recorded during the whole survey period (early, mid and late-season). These were distributed across the Turbine Study Area and across the survey period. A total of nine of the 14 passes were at detector location 12 (which was located by a small, unnamed lochan) during the late season period.

6.7.67 It was assessed that Daubenton's bat had a low overall activity level within the Turbine Study Area.

6.7.68 Daubenton's bats are considered to have a low inherent susceptible of collision/barotrauma with wind turbines. Therefore, the Proposed Development is unlikely to impact upon the small number of Daubenton's bats that use the Turbine Study Area.

6.7.69 The magnitude of impact on Daubenton's bat from potential mortality from the Proposed Development is assessed as negligible. Impacts of mortality from collision/barotrauma is

considered to be unlikely, but potentially occasional throughout the operational lifetime of the wind farm (c. 35 years) and no likely significant effects are predicted (**Table 6.21**).

**Brown long-eared bat**

6.7.70 Brown long-eared bat is considered to be a less common species in Scotland compared to the two pipistrelle species and is generally considered to have an inherently low susceptibility of collision with wind turbines (SNH *et al.,* 2021).

6.7.71 A total of 3 passes by brown-long-eared bat were recorded during the whole survey period (early, mid and late-season). These were all recorded at a single bat detector at the north-east end of the Turbine Study Area, nearest to areas of scattered trees along watercourse valleys (c. 400m from the trees and watercourse) during the late-season period. It was assessed that brown-long-eared bat had a low overall activity level within the Turbine Study Area.

6.7.72 Brown-long-eared bats are considered to have a low inherent susceptible of collision/barotrauma with wind turbines. Therefore, the Proposed Development is unlikely to impact upon the small number of brown-long-eared bat that use the Turbine Study Area.

6.7.73 The magnitude of impact on brown-long-eared bat from potential mortality from the Proposed Development is assessed as negligible. Impacts of mortality from collision/barotrauma is considered to be unlikely, but potentially occasional throughout the operational lifetime of the wind farm (c. 35 years) and no likely significant effects are predicted (**Table 6.21**).

**Table 6.21: Summary of predicted impacts on bats**

| Parameter | Habitat Loss | Loss of Roost Site | Severance and displacement | Direct Mortality |
|---|---|---|---|---|
| **Positive/negative/ neutral** | Negative | Negative | Negative | Negative |
| **Extent** | Development Footprint | None | Watercourses and riparian habitats | Turbine locations |
| **Duration** | Long-term | Long-term | Long-term | Short-term |
| **Reversibility** | Irreversible | Irreversible | Irreversible | Irreversible (for the individual). Reversible (for the population) |
| **Frequency** | One-off | Never | One-off/never | Intermittent |
| **Probability** | Unlikely | Unlikely | Unlikely | Unlikely |
| **Magnitude** | Negligible | None | Negligible | Negligible |

*Summary*

6.7.74 In summary, if the above embedded mitigation measures are implemented no likely significant effects are predicted for bats in relation to the construction and operation of the Proposed Development. However, being legally protected, if any large trees are

identified for felling (none are planned to be felled at the time of writing), then bat roost potential surveys would also be required. This pre-construction protected species survey is recommended as a planning condition.

6.7.75 The recent guidance on bats requires consideration of impacts on bats with regard to the regional population and with regard to FCS definitions. The Turbine Study Area is within the known range for all four species of bat (Crawley *et al*., 2020), and although the population for Lorn area is unknown, the Scottish population estimates are provided in **Table 6.11.**

6.7.76 The potential magnitude of mortality on bats would likely be negligible on the local population, with no likely significant effects predicted i.e. there would be no detectable population level impacts. Therefore, if the Proposed Development was built, the available information indicates that conservation status would not likely be affected because (as articulated in the Habitats Directive):

- All four species of bats are likely to maintain themselves on a long-term basis as a viable component of its habitat in the Lorn area.
- The natural range of all four species of bats in the Lorn area would not be reduced by the Proposed Development, nor would it become likely to be reduced in the foreseeable future.
- There would be (and would continue to be) a sufficiently large habitat area in the Lorn area to maintain the population of all four species on a long-term basis should the Proposed Development be built.

**Semi-natural habitats**

6.7.77 This section describes the predicted effects on semi-natural habitats[4] that could arise, from the construction and operation of the Proposed Development. Embedded mitigation, including avoidance and minimisation to reduce potential effects are described.

6.7.78 The construction and operation of the Proposed Development has the potential to adversely affect semi-natural habitats directly or indirectly in a number of ways, for example:

- direct habitats loss, with a temporary habitat loss at construction and a smaller, but permanent habitat loss during operation;
- severance or fragmentation;
- indirect impacts through changes in hydrology; and
- pollution.

6.7.79 Baseline habitat surveys were completed with a number of typical, widespread upland habitats identified including blanket bog and wet dwarf shrub heath (e.g. **Volume 3a, Figure 6.3a**). Habitats within the Turbine Study Area are not legally protected, although some were listed on the SBL and were equivalent to or approaching Annex 1 habitat definitions. Within the Turbine Study Area, the quantity/quality of semi-natural habitats were evaluated as locally important, except for the blanket bog and bog pools and the semi-natural broadleaved woodland.

[4] Defined as "An ecosystem with most of its processes and biodiversity intact, though altered by human activity in strength or abundance relative to the natural state (e.g. ipbes, 2024). In the UK most habitat types would be defined as semi-natural, with some habitats such as agricultural fields or coniferous plantation being considered not semi-natural due to their being e.g. a monoculture or extensive modification.

6.7.80 Some of the blanket bog habitat within the Turbine Study Area forms part of the Carbon and Peatland Map 'Nationally Important resource'. However, the quality and condition of the blanket bog within the Turbine Study Area was highly variable, with the most important blanket bog habitat being that of the Near-Natural blanket bog which was considered likely to be active and meeting Annex 1 priority habitat descriptions.

6.7.81 The semi-natural broadleaved woodland was considered to be of regional importance due to its connectivity with the surrounding designated sites.

6.7.82 Examples of embedded mitigation to avoid and minimise impacts on semi-natural habitats were described in **Section 6.6** and included:

- Avoidance of infrastructure on all Near-Natural blanket bog.
- Minimising impacts on all blanket bog habitat.
- Design iterations were considered in relation to the land-take of blanket bog and altered accordingly. For example, reducing track length, re-routing track around areas of Near-Natural blanket bog, and re-siting of turbines. Further design iteration details are provided in **Chapter 2**.
- Minimising impacts on blanket bog through the use of floating tracks.
- Avoidance and minimising impacts to habitats associated with watercourses.
- Avoidance/minimisation of semi-natural woodland habitats.

*Direct Habitat Loss*

6.7.83 Direct impacts from land-take on habitats have been considered by overlaying the Proposed Development layout supplied by the Applicant on to the Phase 1 Habitat and NVC maps (**Volume 3a, Figure 6.3a-b**) and the PCA map (**Volume 3a, Figure 6.4**).

6.7.84 Full details of the land-take calculations are provided in **Technical Appendix 6.12**, including methods, rational and assumptions.

6.7.85 The land-take calculations have been split into two discrete areas:

- The Site Access Study Area from NM 968 324 in the north Fearnoch Forest until the NM 983 272 (the start of the original Site Boundary), which includes a construction compound area;
- The Turbine Study Area which includes all other infrastructure i.e. the seven turbine locations, with associated crane pad hard standings, construction compound and the tracks.

6.7.86 These areas correspond to the two habitat surveys that were undertaken and are reported in **Technical Appendix 6.2** and **6.4.**

6.7.87 The total predicted land-take from these locations can be seen in **Table 6.22** and **Table 6.23** with full details provided in **Technical Appendix 6.12**.

**Direct Habitat Loss in the Site Access Study Area**

6.7.88 The predicted habitat loss as a consequence of land-take caused during construction and operation of the Site Access is presented in **Table 6.24**. Full details of e.g. how these were calculated, what was included, buffers, assumptions and limitations are provided in **Technical Appendix 6.12**.

**Table 6.22: Predicted direct habitat loss from the Site Access Study Area**

| Phase 1 Habitat | Operation Loss (ha) | Construction Loss (ha) |
|---|---|---|
| Semi-natural broadleaved woodland | 1.66 | 5.62 |
| Coniferous plantation | 1.13 | 4.17 |
| Felled plantation | 0.30 | 0.97 |
| Unimproved acid grassland | 0.87 | 1.86 |
| Semi-improved acid grassland | 0.36 | 1.89 |
| Neutral grassland | 0.11 | 0.41 |
| Marshy grassland | 0.28 | 0.80 |
| Bracken | 0.14 | 0.65 |
| Dry heath | 0.06 | 0.16 |
| Introduced scrub | 0.02 | 0.07 |
| Buildings, tracks etc | 3.69 | 4.72 |
| Private | 0.02 | 0.18 |
| ***Total*** | ***8.65*** | **21.52** |

6.7.89 The majority of the habitat predicted lost as a result of the access upgrade to the existing road would be semi-natural woodland, closely followed by the existing track and coniferous plantation. There would also be losses of acid grassland and felled plantation. Much smaller amounts of other habitat types are predicted to be lost as a consequence of the Site Access land-take. These include marshy grassland, bracken, and dry heath.

6.7.90 Due to standard limitations and assumptions in relation to land-take calculations, including e.g. generic buffer distance, a small amount of 'private land' is included in the land-take metrics. To be clear, no private land will be lost from the Proposed Development. This area will be carefully micro-sited around. The limitations and assumptions relating to land-take calculations are explained and discussed in **Technical Appendix 6.12.**

6.7.91 Embedded mitigation includes micro-siting (up to 50 m) which would be used to relocate infrastructure to further avoid any sensitive habitats including e.g. large oak trees and wet woodlands. Micro-siting would necessarily be carried out on the ground under supervision by the ECoW. Along the existing track micro-siting would include firstly keeping as much of the impact on the existing track as possible, including the existing 'cut and fill'. Additionally, habitats such as stream edges and flushes would be avoided, and best practice techniques used for bridges and culverts.

6.7.92 There is an estimated 5.6 ha on semi-natural broadleaved woodland including NVC communities W4, W7 and W11. It should be noted that the land-take calculations were precautionary so as not to underestimate potential impacts. They included a 3 m 'batter' to take account of cables and drains, plus cut and fill and a 7.5 m buffer for additional impacts. Therefore, this likely resulted in an over estimation of predicted semi-natural broadleaved woodland land-take losses. The ECoW will provide advice to minimise preventable impacts on all these woodland habitats and minimise the loss of native trees. The areas of non-native plantation forestry that would be affected to facilitate the Proposed Development are shown in more detail in **Technical Appendix 13.1**. Forestry impacts and compensatory planting requirements are discussed further in **Chapter 13**.

At the time of writing (July 2025), which individual trees may need felling along the Site Access is unknown.

6.7.93 Embedded mitigation includes retaining trees where possible, including large oaks or other notable or veteran tree. It also includes where possible, preserving the topsoil from the habitat that is lost and laying it over the top of the areas to be reinstated (e.g. over the 'cut and fill'). This will provide a native, local provenance seed source as well as viable root matter for the areas being reinstated. Therefore, the reinstated vegetation is likely to be similar, if not the same, habitat type as previously present.

**Direct Habitat Loss in the Turbine Study Area**

6.7.94 The estimated habitat loss in the Turbine Study Area as a consequence of land-take caused during construction and operation of the Proposed Development (so, excluding the Site Access) is presented in **Table 6.23**. Full details of how these figures were calculated, what was included, buffers, assumptions and limitations are provided in **Technical Appendix 6.12**. Note there are assumptions relating to the proportion of wet heath/blanket bog mosaics included in these metrics.

**Table 6.23: Predicted direct habitat loss from the Turbine Study Area**

| Phase 1 Habitat | Operational Loss (ha) | Construction Loss (ha) |
|---|---|---|
| Blanket bog[5] | 2.614 | 7.819 |
| Wet heath[6] | 3.524 | 10.122 |
| Dry heath | 0.005 | 0.024 |
| Dry heath/acid grassland | 0.084 | 0.361 |
| Scrub | 0.041 | 0.094 |
| Acid grassland[7] | 0.637 | 2.449 |
| Marshy grassland | 0.02 | 0.133 |
| Tracks and Hardstanding | 2.24 | 3.14 |
| ***Total*** | ***9.166*** | ***24.142*** |

6.7.95 The majority of the habitat predicted to be lost as a result of the Proposed Development Footprint within the Turbine Study Area would be wet heath with a total 10.1 ha predicted to be lost at construction, followed by blanket bog with a total 7.8 ha predicted to be lost at construction. Much smaller areas are predicted to be lost from other habitat types for example dry heath (0.02 ha at construction), acid grassland (2.4 ha at construction) and dry heath acid grassland mosaic (0.36 ha at construction).

6.7.96 Embedded mitigation includes micro-siting (50 m) which would be used to relocate infrastructure to further avoid any sensitive habitats, such as any construction impacts on e.g. bog pools. This would necessarily be carried out on the ground under supervision by the ECoW. Embedded mitigation also includes, where possible, preserving the

[5] Includes blanket bog plus a proportion of the wet heath/blanket bog mosaics See Technical Appendix 7.12 for details.
[6] Includes wet heath, and wet heath mosaics plus a proportion of the wet heath/blanket bog mosaics. See Technical Appendix 7.12 for details.
[7] Includes acid grassland plus a proportion of the wet heath/blanket bog with proportions of acid grassland mosaics. See Technical Appendix 7.12 for details.

topsoil/acrotelm from the habitat that is lost and laying it over the top of the areas to be reinstated (e.g. over the 'cut and fill'). This will provide a native, local provenance seed source as well as viable root matter for the areas being reinstated. Therefore, the reinstated vegetation is likely to be similar, if not the same, habitat type as previously present.

6.7.97 The land-take calculations predict a total loss 0.04 ha of Near-Natural blanket bog as a consequent of land-take at construction. This predicted loss of Near-Natural bog is a subset of the 7.82 ha of blanket bog predicted to be lost in **Table 6.24**. Full details are in **Technical Appendix 6.12.** The remining blanket bog predicted to be lost was in a Modified or Actively Eroding condition, albeit with some of the impact on a more lightly modified condition. The predicted impacts on Near-Natural blanket bog were from two specific locations of track. Full details, including consideration of assumption and mitigation are provided in **Technical Appendix 6.12** and are summarised here.

- The land-take calculations assumed large buffers on all tracks. The tracks in the specific location that would impact Near-Natural blanket bog are proposed to be floating tracks (embedded mitigation) and so impacts would be reduced.
- Some of the Near-Natural blanket bog was in very close proximity to the existing wind farm infrastructure demonstrating their co-existence is possible.
- Any 'cut and fill' or impact from vehicles should be concentrated away from the Near-Natural blanket bog and under direction of the ECoW. Changes in drainage are considered by a hydrologist (**Chapter 8**) and could include preventing water loss from areas of nearby Near-Natural blanket bog.
- Embedded mitigation includes, where possible, preserving the acrotelm from the habitat that is lost and laying it over the top of the areas to be reinstated (e.g. over the 'cut and fill'). This will provide a local seed source as well as viable root matter for the areas being reinstated. Around the Near-Natural blanket bog, this should be completed as soon as possible after the removal of the acrotelm.

6.7.98 With 'worse-case' predicted losses of 7.8 ha of total blanket bog, of which only 0.04 ha is at or approaching Near-natural condition, almost all predicted blanket bog losses will occur on Modified (i.e. degraded and likely non-active) blanket bog. Taking the mitigations outlined above into consideration, it is considered likely that all the Near-Natural blanket bog can and should be avoided by the Proposed Development.

*Assessment of Direct Habitat Loss*

6.7.99 **Table 6.24** provides the habitat loss (at construction, which is largest) as a proportion of the habitats in the two Study Areas, at the regional scale and at the national (Scottish) scale for key habitats. The published Argyll and Bute wide metrics, on which regional estimates are based come from the Argyll and Bute Council's Local Biodiversity Strategy and Action Plan (Argyll and Bute Council, *ibid*). It should be noted that these metrics are c. 15 years old, so they should be interpreted cautiously. The Scottish metrics are from those reported by the Joint Nature Conservation Committee (JNCC) (2015) and the Ancient Woodland Inventory (Scottish Government, 2023).

**Table 6.24 The construction habitat loss and magnitude**

| Phase 1 habitat | Proportional Site Access Study Area loss and magnitude | Proportional Turbine Study Area loss and magnitude | Proportional regional loss and magnitude | Proportional Scottish loss and magnitude |
|---|---|---|---|---|
| Blanket bog | N/A | A total of 7.8 ha of blanket bog, is predicted to be lost from the construction of the Proposed Development out of the estimated 260.5 ha Turbine Study Area resource = 2.9 %<br>Magnitude of predicted change = **Minor** | A total of 7.8 ha of blanket bog, is predicted to be lost from the Proposed Development out of the 24,500 ha regional resource = 0.0032 %<br>Magnitude of predicted change = **Negligible** | A total of 7.8 ha of unmodified blanket bog is predicted to be lost from the proposed development out of the 1,759,000 ha Scottish resource = 0.0004 %<br>Magnitude of predicted change = **Negligible** |
| Wet heath | N/A | A total of 10.1 ha of wet heath is predicted to be lost from the proposed development out of the 343.0 ha Turbine Study Area resource = 2.9%<br>Magnitude of predicted change = **Minor** | A total of 10.1 ha of wet heath is predicted to be lost from the proposed development out of the 153,300 ha regional resource = 0.0065 %<br>Magnitude of predicted change = **Negligible** | A total of 10.1 ha of wet dwarf shrub heath is predicted to be lost from the proposed development out of the 370,000 ha Scottish resource = 0.0027 %<br>Magnitude of predicted change = **Negligible** |
| Dry heath | A total of 0.16 ha of dry heath is predicted to be lost from construction of the Site Access out of the 1.2 ha Site Access Study Area resource = 13.3 %<br>Magnitude of predicted change = **Moderate** | A total of 0.60 ha of dry heath and dry heath: acid grassland mosaic is predicted to be lost from the proposed development out of the 58.49 ha Turbine Study Area resource = 1.0 %<br>Magnitude of predicted change = **Minor** | A total of 0.76 ha of dry heath is predicted to be lost from the Proposed Development out of the 153,300 ha regional resource = 0.00049 %<br>Magnitude of predicted change = **Negligible** | A total of 0.76 ha of dry heath is predicted to be lost from the Proposed Development out of the 479,000 ha Scottish resource = 0.00016 %<br>Magnitude of predicted change = **Negligible** |
| Semi-natural broadleaved woodland | A total of 5.6 ha of semi-natural woodland, is predicted to be lost from the construction of the Site Access out of the estimated 37.5 ha Site Access Study Area resource = 14.9 %<br>Magnitude of predicted change = **Moderate** | A total of 0.09 ha of scrub woodland is predicted to be lost from the Proposed Development out of the 2.3 ha Turbine Study Area resource = 3.9 %<br>Magnitude of predicted change = **Minor** | A total of 5.69 ha of semi-natural broad-leaved woodland is predicted to be lost from the Proposed Development out of the 27,000 ha regional resource<br>resource = 0.021%<br>Magnitude of predicted change = **Negligible** | A total of 5.69 ha of semi-natural broad-leaved woodland is predicted to be lost from the Proposed Development compared to the 63,300 ha Scottish AWI<br>resource = 0.0089%<br>Magnitude of predicted change = **Negligible** |

6.7.100 The land-take assessment shown in **Table 6.24** is presented for the construction land-take. The operational land-take is a subset of constructional loss and so is evidently smaller. The construction loss includes the 'cut and fill' plus a buffer (7.5 m or 10.5 m) around all infrastructure including tracks, crane pads and the construction compound to take account of additional habitat that may be lost/damaged or otherwise impacted during constructions. This is precautionary. The buffer around the infrastructure is unlikely to extend far for some/most of the infrastructure, but exactly how much and where is unclear at this stage. Buffers would avoid any habitats considered particularly sensitive by an ECoW.

6.7.101 The habitat with the largest amount of predicted construction land-take loss was wet heath. Wet heath was assessed as being of local importance and the magnitude of impact that would arise as a consequence of construction land-take was assessed as **minor** at the Study Area scale and **negligible** at the regional and national scale (**Table 6.24**).

6.7.102 The potential magnitude of land-take on wet heath would likely be minor on the local compared to the large local wet heath habitat resource, with no likely significant effects predicted i.e. there would be no detectable change in the local resource. Therefore, if the Proposed Development was built, the available information indicates that conservation status would not likely be affected because:

- The wet heath habitat would be maintained on a long-term basis in the Lorn area.
- The natural range of wet heath in the Lorn area would not be reduced by the Proposed Development, nor would it become likely to be reduced in the foreseeable future.
- There would be (and would continue to be) a sufficiently large area of wet heath in the Lorn area to maintain the populations of species that rely on wet heath as a habitat should the Proposed Development be built.

6.7.103 Blanket bog was the habitat with the next largest amount of predicted construction land-take loss. Blanket bog was assessed as being part of the nationally important resource, although only a small proportion of the blanket bog was considered to be or approaching Near-Natural condition. The magnitude of impact that would arise as a consequence of construction land-take was assessed as **minor** for the Turbine Study Area scale and **negligible** at the regional and national scale (**Table 6.24**).

6.7.104 Given land-take and mapping limitations and assumptions (see **Technical Appendix 6.12** for details) it is considered likely that all the Near-Natural blanket bog will be avoided through careful micro-siting and consideration by an ECoW with experience of upland habitats.

6.7.105 Given the embedded mitigation, including avoiding all the better quality Near-Natural blanket bog habitat, the magnitude of change as a consequence of land-take is assessed overall minor. The impact caused by land-take of bog habitats is considered to be likely, one-off, irreversible and long-term and no likely significant effects are predicted (**Table 6.25**).

6.7.106 The potential magnitude of land-take on blanket bog would likely be minor on the local compared to the local habitat resource, with no likely significant effects predicted i.e. there would be no detectable change in the local resource. Therefore, if the Proposed Development was built, the available information indicates that conservation status would not likely be affected because:

- The blanket bog habitat would be maintained on a long-term basis in the Lorn area.
- The natural range of blanket bog in the Lorn area would not be reduced by the Proposed Development, nor would it become likely to be reduced in the foreseeable future.
- There would be (and would continue to be) a sufficiently large area of blanket bog habitat in the Lorn area to maintain the populations of species that rely on blanket bog as a habitat should the Proposed Development be built.

6.7.107 Semi-natural woodland was assessed as being of regional importance and the magnitude of impact that would arise as a consequence of construction land-take was assessed as **moderate** for the Site Access Study Area and **minor** at the Turbine Study Area scale and negligible at the regional and national scale (**Table 6.24**).

6.7.108 The Site Access Study Area was 100 m either side of the Site Access. Semi-natural woodland is much more widespread in the wider area beyond the 100 m. Forestry issues and compensatory planting requirements are discussed further in **Chapter 13**. The areas of non-native plantation forestry that would be affected to facilitate the Proposed Development are shown in more detail in **Technical Appendix 13.1**. Much of the semi-natural woodland predicted to be lost is along the edge of existing tracks, some at steep watercourse embankments which would likely be avoided due to the nature of the topography. In the land-take calculations a 3 m 'batter' was added to either side of the track to take account of drains and cables, plus a 7.5 m buffer was added and the predicted cut and fill was merged with this so all the track had a minimum of 10.5m additional impact added beyond that of the actual track footprint. This is likely to be an overestimation when there is already a track footprint.

6.7.109 Taking these aspects into consideration and given the embedded mitigation, including avoiding e.g. large, mature oak or other notable or veteran trees and micro-siting away from e.g. wet woodlands, the magnitude of change as a consequence of land-take is assessed overall **minor**. The impact caused by land-take semi-natural woodland is considered to be likely, one-off, irreversible and long-term and no likely significant effects are predicted (**Table 6.25**).

6.7.110 The potential magnitude of land-take on semi-natural woodland would likely be **minor** on the local habitat resource, with no likely significant effects predicted i.e. there would be no detectable change in the local resource. Therefore, if the Proposed Development was built, the available information indicates that conservation status would not likely be affected because:

- The semi-natural woodland habitat would be maintained on a long-term basis in the Lorn area.
- The natural range of semi-natural woodland in the Lorn area would not be reduced by the Proposed Development, nor would it become likely to be reduced in the foreseeable future.
- There would be (and would continue to be) a sufficiently large area of semi-natural woodland in the Lorn area to maintain the populations of species that rely on wet heath as a habitat should the Proposed Development be built.

6.7.111 The magnitude of change as a consequence of land-take on all other habitat types is assessed as **minor-negligible**. The impact caused by land-take is considered to be likely, one-off, irreversible and long-term and no likely significant effects are predicted.

*Severance*

6.7.112 Severance or fragmentation has the potential to adversely affect habitat connectivity for individuals, propagules or gene flow. Tracks have the potential to separate terrestrial habitats and impede movements of associated species. The average width of all new proposed tracks is 5.5 m. There is no evidence that any of the important ecological receptors associated with the two Study Areas habitats would find a 5.5 m track, and associated cuttings and embankments, a physical barrier, causing severance and preventing propagule movement or gene flow between habitat patches. The Proposed Development is set within a landscape of blanket bog, wet modified bog, wet heath and already includes track and wind farm infrastructure. The Site Access Study Area already has an existing (albeit slightly narrower) track throughout. It is considered highly unlikely, that the Proposed Development would prevent or inhibit the movement of individuals, propagules or gene flow. The magnitude of change as a consequence of severance is assessed as negligible. The impact caused by severance is considered to be unlikely, one-off, irreversible and long-term and no likely significant effects are predicted (**Table 6.25**).

*Indirect impacts on habitats through changes in hydrology*

6.7.113 Potential indirect impacts on habitats could arise from changes in drainage which can adversely impact on habitats by altering the amount of water a habitat receives or retains. These potential hydrological impacts are considered in **Chapter 8** which takes into account standard mitigation, in particular implementation of a suitable CEMP, which will include measures for minimising disruption to groundwater flow, suitable surface water drainage and Sustainable Drainage Systems (SuDS).

6.7.114 The proposed new track has associated drainage alongside it. The existing track already has drainage alongside it but would be upgraded. Details are provided in **Chapter 2** and hydrological impacts are considered in **Chapter 8**. The shallow track drains associated with the new and upgraded track, are designed following standard guidance and are designed to drain the road surface and not drain the adjacent vegetation. Unlike deeper drainage ditches (moorland grips) in bog habitat which are designed to lower the water-table the track drains are shallow (c. 0.5 m).

6.7.115 No clear guidance is set out for consideration of potential indirect drainage impacts beyond that of blanket bog. However, hydrology, groundwater and watercourses are considered in detail in **Chapter 8**. A buffer of either 7.5 m or 10.5 m wide (**Technical Appendix 6.12**) has already been placed around all infrastructure as a construction buffer and it is considered unlikely that changes in drainage would extend beyond this on all habitats and so no additional indirect hydrological impacts are predicted for other habitat.

6.7.116 For blanket bog habitat, NatureScot advocates a 30 m drainage buffer around all infrastructure (NatureScot, 2023) and comment that indirect impacts would be treated in the same manner as direct impacts. However, there are several important considerations to take account of:

- The design of the wind farm was such that wherever possible blanket bog, particularly where it was on deeper peat (>1 m) and Near-Natural condition was avoided. Infrastructure was placed towards the edge of bog habitat (rather than going across the blanket bog) wherever possible and so drainage impacts would be minimised through design.

- There is clear evidence of blanket bog in a Near-Natural condition with bog pools and a wet surface within c. 30 m of the current wind farm infrastructure demonstrating that these features can and do co-exist at this site.
- Where there is deep peat the tracks will usually be floated over the blanket bog habitat. Floated tracks will not usually have associated track drains around them, and they are specially designed not to impeded drainage of the bog. In the land-take calculations all the tracks, including the floating tracks, were given a 3 m batter (for drains and cables despite there being no drains associated with floating track), plus a 7.5 m construction buffer and the predicted cut and fill. There will be no/minimal 'cut and fill' in flat areas and in areas where floating track will be essentially lain over the surface of the bog, and so machine works will be accordingly minimised. The ECoW will also be able to direct works away from bog habitat. Therefore, there is already a 10.5 m buffer around the tracks, including the floating tracks. It is considered highly unlikely that potential indirect impacts of changes in hydrology to bog would occur beyond this 10.5m buffer particularly, where tracks have been floated over deep peat located, and in areas near the Near-Natural blanket bog. This is supported by hydrogeological analysis using standard equations (Marinelli, F., and W. L. Niccoli. 2000. Simple analytical equations for estimating ground water inflow to a mine pit. Ground Water 38, no. 2: 311-314) for predicting the cone of drawdown associated with excavations. Given the low permeability of the catotelmic peat there will be very limited dewatering beyond the extent of the 2 in 1 side slopes of the excavations. Any dewatering is therefore limited to the more permeable acrotelm which is less than 0.2m thick and standard hydrogeological equations predict the likely dewatering extent to be less than 10m. Both direct and indirect impacts have been reduced by design.
- CIEEM guidance specifies consideration of *likely effects*. It is considered, in this situation, a hydrological impact of 30 m would be highly unlikely.

6.7.117 Therefore, no additional indirect impacts are calculated for blanket bog, as the land-take calculations have already taken them into account.

6.7.118 No likely significant negative impacts on habitats are predicted from additional drainage or changes in hydrology, including blanket bog, within the Turbine Study Area.

6.7.119 Taking into account the embedded mitigation, the magnitude of change on habitats as a consequence of changes in drainage is assessed as negligible. Additional indirect impacts on habitats as a consequence of changes in drainage/hydrology is considered to be unlikely, one-off, temporary and short-term and no likely significant effects are predicted (**Table 6.25**).

*Pollution*

6.7.120 Potential indirect impacts on the habitats could arise from pollution events. Pollution prevention measures are considered in **Chapter 8** which takes into account standard mitigation, in particular implementation of a suitable CEMP and appropriate storage and management of fuels and chemicals.

6.7.121 Therefore, with the embedded mitigation, the magnitude of change on habitats as a consequence of pollution is assessed as negligible. With the embedded mitigation, the indirect impact on habitats as a consequence of pollution is considered to be unlikely, intermittent, temporary and short-term (event) to medium term (recovery) and no likely significant effects are predicted (**Table 6.25**).

*Summary*

**Table 6.25: Summary of predicted impacts on semi-natural habitats**

| Parameter | Habitat Loss | Severance | Change in Hydrology | Pollution | Fire |
|---|---|---|---|---|---|
| **Positive/negative/ neutral** | Negative | Negative | Negative | Negative | Negative |
| **Extent** | Development Footprint | Site wide | Around Development Footprint | Watercourses | Around Development Footprint |
| **Duration** | Long-term | Long-term | Short-term | Short-term (event) medium-term (recovery) | Short-term (event) long-term (recovery) |
| **Reversibility** | Irreversible | Irreversible | Reversible | Reversible | Reversible |
| **Frequency** | One-off | One-off | One-off | Intermittent | Intermittent |
| **Probability** | Likely | Unlikely | Unlikely | Unlikely | Unlikely |
| **Magnitude** | Minor-negligible | Negligible | Negligible | Negligible | Low |

6.7.122 In summary, if the above embedded mitigation measures are implemented, then no likely significant effects are predicted for semi-natural habitats in relation to the construction and operation of the Proposed Development.

## 6.8 Mitigation

6.8.1 With the full implementation of proposed mitigation measures including avoidance and minimisation through inbuilt design, plus the full implementation of the PMP, CEMP, pollution control measures,, there are no likely significant negative or adverse effects predicted for any potentially important ecological receptors and so a description of the measures envisaged to provide compensation or additional mitigation is not required to be provided as part of the EIAR for the Proposed Development under the EIA Regulations.

6.8.2 However, in light of NS guidance which recommends compensation/offset at a 1:10 ratio (lost:restored) (regardless as to whether effects are predicted to be significant or not) and given the condition of the blanket bog within the Turbine Study Area, the importance of blanket bog and peatland habitats in regard to carbon storage and carbon sequestration and the current climate emergency, peatland restoration has been included in the OBE-HMP (**Technical Appendix 6.10**) as part of the Proposed Development. The OBE-HMP will address the relevant policies of NPF 4. Peatland restoration will provide direct benefits to the blanket bog habitat, the assemblage of species that depend upon it and for the associated ecosystem services benefits e.g. the carbon storage and downstream water quantity and quality. The planned restoration work would include restoration of at least 71.1 ha (9.1x multiplier of the total predicted loss of blanket bog) of degraded peatland habitat providing offset/compensation for the predicted non-significant effects blanket bog habitat. Further details are provided in (**Technical Appendix 6.10**).

6.8.3 The areas intended for peatland restoration exceeds the area of predicted habitat loss (7.8 ha loss compared to c. 71.7 ha proposed peatland restoration. However, it does not

quite meet the 1:10 ratio plus 10% of peatland restoration that is recommended by NatureScot (2023). This is explored further in **Technical Appendix 5.15**. It should be noted that NS guidance (2023) is likely to change/be replaced as a result of the Peat Expert Advisory Group (PEAG).

Further ecological surveys will be undertaken by an ECoW prior to earthworks in each area to check for protected species etc. Peat reinstatement, restoration and enhancements will be monitored for the lifetime of the development, with a higher frequency of monitoring during the construction and immediate period post construction to ensure good peatland recovery. This monitoring is further detailed with Chapter 6 Ecology.

## 6.9 Residual Effects

**6.9.1** With the implementation of proposed mitigation measures, there are no likely significant residual negative effects predicted for any potentially important ecological receptors and so offset/compensation is not necessary for the Proposed Development.

## 6.10 Cumulative Effects

6.10.1 There are no likely significant effects predicted for any ecological receptors at the Proposed Development. Therefore, no effect is likely to influence the outcome of the consenting process, alone or in combination with other developments. Consequently, no likely significant cumulative effects are predicted.

## 6.11 Enhancement

6.11.1 The OBE-HMP (**Technical Appendix 6.10**) identifies six main enhancement objectives to be implemented within the OBE-HMP Study Area (**Volume 3a, Figure 6.1**), two of which will have direct ecological benefits to the blanket bog habitats within and around the Turbine Study Area. These include reduced grazing pressure and peatland restoration. Whilst the peatland restoration measures are under the auspices of habitat mitigation, they will nonetheless have wider ecological benefits increasing the biodiversity and providing additional habitat for a wide range of species including localised/rare invertebrates such as azure hawker (a dragonfly), large heath (a butterfly) and agent and sable (a moth) as well as reptiles, bats and birds.

6.11.2 A key objective in the OBE-HMP is creating and strengthening nature networks, which are likely to help provide resilience to biodiversity during the climate crisis. Tackling the Nature Emergency - Scottish Biodiversity Strategy to 2045 (Scottish Government, 2023) has a commitment to "*Ensure that every local authority area has a nature network of locally driven projects improving ecological connectivity across Scotland*". The overarching purpose of the 'nature network' commitment is connecting habitats and species at a landscape scale, improving ecological connectivity, creating functioning, healthy and robust ecosystems which mitigate and adapt to the impacts of climate change and provide multiple benefits for society. In addition, Policy 3 of NPF4 promotes the strengthening of nature networks and whereas Policy 6 of NPF4 advocates the enhancement and expansion of woodland.

6.11.3 The objectives within the OBE-HMP for peatland restoration are summarised below.

- Objective 1: Reduce grazing and browsing pressure;
- Objective 2: Peatland restoration;
- Objective 3: Creating and strengthening nature networks;
- Objective 4: Pond/lochan creation;
- Objective 5: Targeted priority species action;
- Objective 6: White-tailed eagle fatality monitoring; and
- Objective 7: Operational Carcass Recovery Scheme.

**Potential Effects of Enhancement Measures**

6.11.4 The habitat restoration measures of reduced grazing, peatland restoration, creating and strengthening nature networks and pond/lochan creation are considered highly suitable and appropriate for the Study Area. The benefits of peatland restoration are widely recognised through large scale peatland restoration projects (e.g. Moors for the Future; Peatland Action). A reduction in grazing intensity alone is known to have significant beneficial impacts not just on vegetation but on the wider ecosystem. For example, at Glen Finglas, reduced sheep grazing intensity resulted in increased insect and spider species richness and increased mammal density. Recent studies have also demonstrated an increase in priority bird species richness and abundance in areas with reduced sheep grazing (e.g. Malm *et al*., 2020).

6.11.5 The benefits of creating and strengthening nature networks was emphasized in Policy 3 of NPF4. The proposed nature networks within the OBE-HMP demonstrably provide connectivity in the landscape and delivers on this policy.

6.11.6 Consideration of the benefits of biodiversity enhancement follow CIEEM (2018) guidelines and demonstrate that these enhancement measures would likely provide a minor-moderate positive impact on the habitat resources within the Turbine Study Area and likely significant effects are predicted (**Table 6.26**).

**Table 6.26: Summary of predicted impacts of enhancement measures on biodiversity in the OBE-HMP Study Area and OBE-HMP.**

| Parameter | Reduced grazing | Peatland restoration | Creation and strengthening of nature networks | Loch/pool creation |
|---|---|---|---|---|
| Negative/ Positive/neutral | Positive | Positive | Positive | Positive |
| Extent | The extent will be beyond the Site. Reduced grazing will benefit the whole estate and potentially beyond as deer move freely in the landscape. | OBE-HMP Area wide.<br>The extent will be a minimum of 73 ha. | OBE-HMP Area wide.<br>The extent will be beyond the Site with planting of riparian and connectivity corridors across the wider landscape. | Localised areas where lochans and pools created. |
| Duration | The benefits to peatland habitats from reduced grazing, are likely to be long-term, beyond the lifetime of the Proposed Development. | The benefits to peatland habitats from peatland restoration are likely to be very long-term, beyond the lifetime of the Proposed Development. | The benefits of tree planting creating and strengthening of nature networks, are likely to be very long-term, beyond the lifetime of the Proposed Development. | The benefits to peatland habitats from pond creation are likely to be very long-term, beyond the lifetime of the Proposed Development. |
| Reversibility | The benefits from these actions would be reversed if grazing pressure was increase and in the current climate emergency, it seems unlikely that these actions would be reversed. | The benefits from peatland restoration would be reversed if e.g. drainage ditches were re-dug. In the current climate emergency, it seems unlikely that these habitat restoration actions would be reversed. | The benefits from these actions would be reversed if e.g. trees were removed. In the current climate emergency, it seems unlikely that these habitat restoration actions would be reversed. | The benefits from these actions would be reversed if pools were drained. In the current biodiversity emergency, it seems unlikely that these habitat restoration actions would be reversed. |
| Frequency | Grazing control will be undertaken annual. | Peatland restoration such as hagg reprofiling and drainage ditch blocking will be a one-off event. | Tree planting will be one-off. | Lochan creation will be one off. |
| Probability | The biodiversity benefits for reduced grazing in upland habitats are well documented. | The benefits from peatland restoration actions are certain. Many large-scale habitat restoration projects have been implemented and the recovery of bogs is documented. The effectiveness of best practice restoration techniques are developing rapidly. | The benefits from planting and maintaining riparian woodlands and woodland corridors is well documented. | The biodiversity benefits of pool creation in upland habitats are well documented. |
| Magnitude | The magnitude of change was considered to be **minor-moderate** (at a local level) and **negligible** at all other levels considered. | The magnitude of change was considered to be **moderate** (at a local level) and **negligible** at all other levels considered. | The magnitude of change was considered to be **moderate** (at a local and regional level) and **negligible** at all other levels considered. | The magnitude of change was considered to be **negligible-minor** (at a local level) and negligible at all other levels considered. |

## 6.12 Summary of Effects

6.12.1 This assessment does not predict any likely significant adverse ecological residual effects associated with the Proposed Development.

6.12.2 **Table 6.27** provides a summary of the conclusions of the EcIA with respect to each ecological receptor taking into consideration embedded and any additional mitigation measures.

**Table 6.27: Summary – Ecology**

| Key receptor | Description of effect | Significance of potential effect | | Mitigation measure | Significance of residual effect | |
|---|---|---|---|---|---|---|
| | | Likely significance? | Positive/ negative | | Likely significance? | Positive/negative |
| Designated sites | Direct land-take | None | Negative | None required, avoided by design. | None | Negative |
| | Indirect effects | None | Negative | E.g. pollution prevention measures. | None | Negative |
| Badger | Direct land-take | None | Negative | E.g. pre-construction surveys and exclusion zones if a new sett is discovered. A Badger Species Protection Plan will be developed and implemented. | None | Negative |
| | Severance | None | Negative | E.g. any fencing during for construction, operation or as part of the OBE-HMP will be permeable and mammal friendly. | None | Negative |
| | Disturbance | None | Negative | E.g. pre-construction surveys and exclusion zones if a new sett is discovered. | None | Negative |
| | Mortality | None | Negative | E.g. exposed pipe systems will be capped when contractors are off site, and exposed trenches or holes will be covered or exit ramps provided to prevent badgers becoming trapped. Low vehicle speeds. A Badger Species Protection Plan will be developed and implemented. | None | Negative |
| Otter | Direct land-take | None | Negative | E.g. pre-construction surveys. Avoidance and minimising crossing watercourses and riparian habitat. An Otter Species Protection Plan will be developed and implemented. | None | Negative |
| | Severance | None | Negative | E.g. avoidance and minimising crossing watercourses and riparian habitat. Mammal friendly designs will be used for culverts and bridges to | None | Negative |

| Key receptor | Description of effect | Significance of potential effect | | Mitigation measure | Significance of residual effect | |
|---|---|---|---|---|---|---|
| | | Likely significance? | Positive/ negative | | Likely significance? | Positive/negative |
| | | | | provide safe access and crossing points. | | |
| | Pollution | None | Negative | E.g. pollution prevention measures. | None | Negative |
| | Disturbance | None | Negative | None required. | None | Negative |
| | Mortality | None | Negative | E.g. exposed pipe systems will be capped when contractors are off site, and exposed trenches or holes will be covered or exit ramps provided to prevent otters becoming trapped. Low vehicle speed. An Otter Species Protection Plan will be developed and implemented. | None | Negative |
| Red Squirrel | Direct land-take | None | Negative | A Red Squirrel Species Protection Plan will be developed and implemented. | None | Negative |
| | Severance | None | Negative | None required. | None | Negative |
| | Disturbance | None | Negative | None required. | None | Negative |
| | Mortality | None | Negative | E.g. low vehicle speeds. A Red Squirrel Species Protection Plan will be developed and implemented. | None | Negative |
| Pine marten | Direct land-take | None | Negative | A Pine Marten Species Protection Plan will be developed and implemented. | None | Negative |
| | Loss of den | None | Negative | None required. | None | Negative |
| | Severance | None | Negative | None required. | None | Negative |
| | Mortality | None | Negative | E.g. low vehicle speeds.<br>A Pine Marten Species Protection Plan will be developed and implemented. | None | Negative |

| Key receptor | Description of effect | Significance of potential effect | | Mitigation measure | Significance of residual effect | |
|---|---|---|---|---|---|---|
| | | Likely significance? | Positive/ negative | | Likely significance? | Positive/negative |
| Bats | Direct land-take | None | Negative | E.g. avoidance and minimising of impacts on riparian habitat and watercourses, which had a minimum stand-off distance of 50 m for turbines. | None | Negative |
| | Loss of roosts | None | Negative | None, but bat roost potential surveys required of any mature/old trees that may need to be felled. | None | Negative |
| | Severance | None | Negative | None required. | None | Negative |
| | Mortality | None | Negative | E.g. avoidance and minimising of impacts on riparian habitat and watercourses, which had a minimum stand-off distance of 50 m for turbines. | None | Negative |
| | Enhancement measures | None | Positive | E.g. Riparian planting and woodland creation will likely benefit bats by providing additional foraging habitat. | None | Positive |
| Blanket bog | Land-take | None | Negative | E.g. avoidance and minimising impacts on the better quality blanket bog habitat within the Turbine Study Area. Avoidance and minimising impacts of habitats associated with watercourses and GWDTE. | None | Negative |
| | Severance | None | Negative | No additional mitigation beyond that of land-take. | None | Negative |
| | Changes in hydrology | None | Negative | E.g. implementation of a suitable CEMP, which will include measures for minimising disruption to groundwater flow, suitable surface water drainage and SuDS. | None | Negative |
| | Pollution | None | Negative | E.g. pollution prevention measures. | None | Negative |

| Key receptor | Description of effect | Significance of potential effect | | Mitigation measure | Significance of residual effect | |
|---|---|---|---|---|---|---|
| | | Likely significance? | Positive/ negative | | Likely significance? | Positive/negative |
| | Enhancement measures | Yes | Positive | Peatland restoration, reduced grazing, strengthening and creating nature networks, pond/pool creation, targeted species actions. | Yes | Positive |

## 6.13 References


British Geological Society (BGS), 2023. 'GeoIndex Onshore'.

Chartered Institute of Ecology and Environmental Management, CIEEM, 2017. *Guidelines for Preliminary Ecological Appraisal'*.

CIEEM, CIRIA and IEMA, 2019. '*Biodiversity Net Gain: Good practice principles for development. A Practical Guide (CIRIA C776a)*. CIRIA, London'.

CIEEM, 2018. '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (version 1.2, 2022). CIEEM, Winchester'.

CIEEM, 2019. 'On the lifespan of ecological reports and surveys'.

CIEEM, 2020. '*Biodiversity Net Gain in Scotland. CIEEM Scotland Policy Group*'.

Cosgrove, P., Watt, J., Hastie, L., Sime, I., Shields, D., Cosgrove, C., Brown, L. Isherwood, I. and Bao, M, 2016. '*The status of the freshwater pearl mussel* Margaritifera margaritifera *(L.) in Scotland: extent of change since 1990s, threats and management implications*. Biodiversity and Conservation 25: 2093-2112'.

Crawley, D., Coomber, F., Kubasiewicz, L., Harrower, C., Evans, P., Waggit, J., Smith, B. and Mathews, F, 2020. '*Atlas of Mammals of Great Britain and Northern Ireland*. Pelagic Publishing'.

International Union for Conservation of Nature (IUCN), 2024. 'Available at: https://www.iucnredlist.org/species. Accessed: February 2024.

JNCC, 2015. '*UK Terrestrial and Freshwater Habitat Descriptions 2015: Upland Habitats'.*

Louise de Raad, A., Lurz, P. and Kortland, K. 2021. '*Managing forests for the future: Balancing timber production with the conservation of Eurasian red squirrel (Sciurus vulgaris)*. Forest Ecology and Management 493. 119164'.

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

National Biodiversity Network (NBN) Atlas, 2023-2024). https://nbnatlas.org/.

Scottish Government, 2023. 'National Planning Framework 4 (NPF4)'.

NatureScot (NS), 2018. 'Assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas'.

NS, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd. University of Exeter and Bat Conservation Trust, 2021. '*Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation'*.

NS, 2022. '*Carbon and Peatland 2016* Map. Available at: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/soils/carbon-and-peatland-2016-map.

NS, 2022-24. SiteLink Website. https://sitelink.nature.scot/home.

NS, 2023. '*Advising on carbon-rich soils, deep peat and priority peatland habitat in development management – Guidance'*.

NS, 2023. '*Standing advice for Planning Consultations* - protected species advice (hyperlinks earlier in document)'.

Reason, P.F. and Wray, S, 2023. '*UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats*.' Version 1.1. Chartered Institute of Ecology and Environmental Management, Ampfield.

Scotland's Soils, 2016) Carbon and Peatland Maps. Available at: https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/.

Scottish Government, 2022. 'Scottish Biodiversity Strategy to 2045: Tackling the Nature Emergency in Scotland (published in draft)'.

Scottish Environment Protection Agency, 2017a. '*Land-Use Planning System SEPA Guidance Note 4: Planning Guidance on Wind Farm Developments*. LUPG-GU4 Issue No' 9'.

SEPA, 2017b. '*Land-use planning system SEPA guidance note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems*. LUPG-GU31 Version 3'.

Scottish Government, 2017. 'Planning Circular 1 2017: The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017'.

Scottish Government, 2022. 'Onshore Wind Policy Statement'.

Scottish Government, 2023. 'Draft Planning Guidance for Biodiversity'.

Scottish Government, 2023. '*Ancient Woodland Inventory (Scotland)*. Available at: https://www.data.gov.uk/dataset/c2f57ed9-5601-4864-af5f-a6e73e977f54/ancient-woodland-inventory-scotland.

Stroud, D.A., Mudge, G.P. and Pienkowski, M.W, 1990. '*Protecting Internationally Important Bird Sites: A Review of EEC Special Protected Area Network in Great Britain*. Nature Conservancy Council, Peterborough, UK'.

The Bat Conservation Trust (BCT), 2016. '*Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edition)'.

The Mammal Society, 2018. '*Britain's Mammals 2018: The Mammal Society's Guide to their Population and Conservation Status*. Mammal Society, London'.