

Chapter 8: Ecology

Chapter 8

Ecology

Introduction

8.1 This chapter considers the potential effects of the proposed An Càrr Dubh Wind Farm (hereafter referred to as the 'Proposed Development') on ecology. It constitutes an Ecological Impact Assessment (EclA) which includes the following:

- A description and interpretation of the ecology baseline (including desk-based studies and field surveys);
- The assessment methodology and significance criteria used in assessing effects on ecological features;
- An assessment of the potential effects during the construction and operational phases of the Proposed Development, and consideration of potential cumulative effects with other developments; and
- Mitigation measures proposed to address potential significant effects, where necessary.

8.2 This chapter should be considered in conjunction with the following chapters which inform, or have been informed by, this assessment:

- **Chapter 2: Approach to the EIA;**
- **Chapter 3: Site Selection and Design Strategy;**
- **Chapter 4: Project Description;**
- **Chapter 7: Geology, Hydrology, Hydrogeology, and Peat;** and
- **Chapter 9: Ornithology.**

8.3 The ecology assessment was undertaken by Land Use Consultants (LUC). This EclA was prepared and overseen by professional and experienced ecological consultants with appropriate memberships of the Chartered Institute of Ecology and Environmental Management (MCIEEM), and experience of EclA in the context of wind farm EclA. Field surveys and data collection were undertaken by ecologists who had extensive experience and/or training in undertaking baseline ecological surveys for renewable energy projects (particularly wind farms), and in the assessment of ecological impacts in the Environmental Impact Assessment (EIA) context.

8.4 This chapter is supported by a number of figures which are referenced throughout the text and which can be found at the end of this chapter.

8.5 The following appendices are also referred to throughout the chapter:

- **Appendix 8.1: Desk Study and Legal Context;**
- **Appendix 8.2: Habitats and Vegetation Survey Report;**
- **Appendix 8.3: Protected Species Survey Report;**
- **Appendix 8.4: Bat Survey Report;** and
- **Appendix 8.5: Outline Habitat and Landscape Restoration Management Plan.**

8.6 The following terminology will be referred to throughout this chapter:

- **Site:**
 - All land within the red-line boundary, as shown in **Figure 4.1a** and **4.1b**.

- **Proposed Development:**

- The whole physical process involved in the development of the land at An Càrr Dubh Wind Farm including construction, operation and decommissioning¹ (not associated with a particular piece of land).
- Encompasses the construction of an up to 13 turbine wind farm and associated infrastructure including access tracks, crane hardstandings, substation compound and underground cabling.

- **Study Area**

- The area within which ecology desk-based studies were undertaken (up to 10 kilometres (km) from the Site).

- **Ecology Survey Area (ESA)**

- The area within the red-line boundary in which all ecology surveys were undertaken in line with good practice guidelines for all ecological features surveyed, comprising a buffer up to 500 metres (m) of the proposed infrastructure and a buffer up to 250m along the proposed access route where survey methods dictate (as shown in **Figure 8.1**).

- **Bat Survey Area (BSA)**

- The area within which bat surveys were undertaken in line with good practice guidelines². The Bat Survey Area was therefore defined as a 200m buffer plus rotor radius (77.5m) of proposed turbine locations and a 100m buffer along the proposed access route (as shown in **Figure 8.7**).

Scope of the Assessment

Effects Assessed in Full

8.7 The following effects were identified at the Scoping stage for consideration in this assessment:

- Direct or indirect effects during construction on:
 - Designated sites structurally or functionally connected to the Site.
 - Habitats of conservation interest³.
 - Protected species recorded within the Site.
- Direct or indirect effects during operation on bats.
- Cumulative effects during construction on ecological features.
- Cumulative effects during operation on ecological features.

Effects Scoped Out

8.8 On the basis of the desk based and field survey work undertaken, the professional judgement of the EIA team, experience from other relevant projects, and policy guidance or standards, and feedback received from consultees, the following topic areas have been 'scoped out' of detailed assessment:

- Construction or operational effects on habitats and species generally considered to be widespread and common (i.e. those not protected by the legislation or policy detailed below).

¹ As noted in **Chapter 2**, an assessment of effects during the decommissioning phase has not been undertaken in the EIA as the baseline against which to assess likely significant decommissioning effects is not known. However, a method statement will be prepared and agreed with the relevant statutory consultees prior to decommissioning of the Proposed Development, and it is anticipated that any effects associated with decommissioning will be similar to or less than those associated with construction.

² NatureScot (2021). Bats and onshore wind turbines - survey, assessment and mitigation. Available at: <https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation> [Accessed June 2022]

³ Habitats of conservation interest include habitats considered conservation priorities in the Habitats Directive (i.e. Annex 1 habitats); habitats considered to indicate potential groundwater dependency; habitats included on the Scottish Biodiversity List; and habitats included in the Argyll and Bute Council Biodiversity Technical Note for Planners and Developers (February 2017).

- Construction or operational effects on statutory and non-statutory designated sites on the basis that there is no structural or functional connectivity between the Proposed Development and the sites, the qualifying features of the designated sites are unlikely to be affected by the works, the nature of the Proposed Development and the distance between the Proposed Development and the site(s), and/or specific land uses within a particular site⁴.
- Operational effects on habitats of conservation interest.
- Effects on protected species where the desk study highlighted a lack of suitable habitat, likely absence (e.g., due to species range), and returned no or minimal local records (including great-crested newt, wildcat, fisheries and freshwater pearl mussel).
- Operational effects on protected species, with the exception of bats.

8.9 The Scoping Report scoped out wildcat. This was not challenged in the Scoping Opinion or Scoping Responses of consultees. This species is therefore not considered further within this chapter.

8.10 The Scoping Report also scoped out freshwater pearl mussel and fisheries, and whilst this was challenged in the Scoping Responses from the Argyll District Salmon Fisheries Board, NatureScot did not object. Nevertheless, embedded mitigation measures designed to protect ecological features dependent on the aquatic environment are presented in this chapter (see 'Design Considerations', 'Micrositing' and 'Good Practice Measures' below). These mitigation measures - which include best practice design, construction methods, pre-construction surveys, and survey and monitoring during and post-construction - will ensure no harm to the aquatic environment and aquatic ecological features. When professional judgement is applied in the light of this embedded mitigation, freshwater pearl mussel and fisheries therefore remain scoped out of this assessment.

8.11 It is important to note, however, that whilst effects are scoped out because they are not considered to be significant in EIA terms, the need to ensure compliance with nature conservation legislation still applies. The presence and potential presence of protected species, and notable species⁵, within the Site will require consideration within the Construction Environmental Management Plan (CEMP) and appropriate measures will be necessary to ensure their ongoing ability to survive (viability) and avoid a legal offence.

Cumulative Effects

8.12 The potential cumulative effects of the Proposed Development and other wind farm developments in planning within a 5km search area are considered. Given that the habitats present within the Site are widespread and common in the local landscape and are likely to support a similar assemblage of protected species, 5km is considered an appropriate search area.

8.13 Two other wind farm developments are located within 5km of the Proposed Development. One of these wind farms is operational and so forms part of the baseline condition of the Site (An Suidhe). The other wind farm at the application stage having been previously consented for a greater number of turbines at a lower tip height (Blarghour). A cumulative assessment has therefore been carried out for construction and operational effects based on the EIA of the consented scheme Blarghour⁶.

Changes to Scope

8.14 When the Scoping Report was submitted, the access for the Proposed Development from the public road had not been decided. This has since been confirmed and will be taken from near Inveraray to the south-east of the Site. However, the confirmation and inclusion of the access does not change the scope of the assessment.

Assessment Methodology

Legislation and Guidance

Legislation

8.15 This assessment is carried out in accordance with the principles contained within the following legislation (detailed within **Appendix 8.1**) that creates a mechanism for designated sites, protected habitats, and protected species:

- The Nature Conservation (Habitats, &c.) Regulations 1994 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- The Protection of Badgers Scotland Act 1992 (as amended);
- The Water Environment and Water Services (Scotland) Act 2003 (WEWS); and
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011.

Policy and Guidance

8.16 This assessment is carried out in accordance with the principles contained within the following relevant nature conservation policy or guidance that creates a mechanism for locally-designated sites, habitats, and species of conservation interest:

- The Scottish Biodiversity List (SBL)⁵;
- Argyll and Bute Council Biodiversity Technical Note for Planners and Developers (February 2017);
- The Argyll and Bute Local Biodiversity Action Plan 2010-2015; and
- National⁷ and local planning policy and supplementary guidance.

8.17 Relevant guidance that has informed the assessment methods adopted in the chapter includes:

- Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater and Coastal, 3rd edition, CIEEM (2019)⁸;
- Land Use Planning System: Guidance Note 31 – Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (GWDTE). Scottish Environment Protection Agency (SEPA) (2017)⁹; and
- Good Practice During Windfarm Construction, 4th edition. Scottish Renewables *et al.* (2019)¹⁰.

8.18 Further guidance in relation to survey methods and the interpretation of ecological data is referenced in the relevant appendices, where appropriate.

Consultation

8.19 In undertaking the assessment, consideration has been given to the Scoping Responses and other consultation which has been undertaken as detailed in **Table 8.1**.

8.20 No formal Scoping response was received from SEPA as a result of the major cyber-attack on the organisation in December 2020.

⁴ There are sites listed on the Ancient Woodland Inventory within the east of the Site along the existing track. These lie within commercial forestry (of the Argyll Estate) and are subject to ongoing commercial activities of felling and re-planting.

⁵ NatureScot (2020). *Scottish Biodiversity List*. Available online at: <https://www.nature.scot/doc/scottish-biodiversity-list>.

⁶ It should be noted that the cumulative assessment was undertaken on the basis of the consented Blarghour scheme which comprised 17 turbines up to 136.5m to blade tip. The cumulative assessment undertaken for the Proposed Development included a review of the habitat loss calculations presented in the EIA Report for the consented Blarghour scheme. A revised application for the Blarghour scheme was subsequently made in March 2023 for 14 turbines up to 180m to blade tip (removal of three of the most north-westerly turbines). A review of the application documents for the 14 turbine scheme confirmed limited changes to the assessment compared with the consented scheme, and that the land take, including of bog habitat, reduced slightly. As such, it is considered that the information presented within this chapter remains valid as it has considered a worst case, and the findings of the cumulative assessment do not change as a result of the recently submitted Blarghour Wind Farm application.

⁷ Scottish Government (2022). *National Planning Framework 4*. Available online at: <https://www.transformingplanning.scot/national-planning-framework/approved-npf4/>.

⁸ CIEEM (2018) (version 1.2 updated April 2022). *Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater and Coastal, 3rd edition*. Available online at: <https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/>.

⁹ Scottish Environmental Protection Agency (SEPA) (2017). *Land Use Planning System: Guidance Note 31 – Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (GWDTE)*. Available online at: <https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf>.

¹⁰ Scottish Renewables *et al.* (2019). *Good Practice During Wind Farm Construction*. Available online at: <https://www.nature.scot/guidance-good-practice-during-wind-farm-construction>.

Table 8.1: Consultation Responses

Consultee and Date	Scoping/Other Consultation	Issue Raised	Response/Action Taken
Statutory Consultees			
NatureScot (02/07/2021)	Formal Scoping Response	NatureScot agreed with the proposed scope and assessment method. NatureScot also agreed data from the Ardchnonnal application (2014) was a reliable baseline on which to base the scope of the assessment, but noted the need to account for potential impacts of land management practices in the intervening period. Noted that the Site covers a Class 2 area of the Carbon and Peatland map and 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.	Ecology baseline surveys have been updated and this chapter considers the impact of land management practices since the Ardchnonnal application. Detailed peat probing and a detailed NVC survey have been undertaken. Further details are provided in Chapter 7 and this chapter.
Argyll and Bute Council (ABC) (20/01/2022)	Formal Scoping Response	Advised that habitats particularly vulnerable to damage, or which have higher pollution sensitivity, should be protected from unnecessary impacts. Requested the Applicant contact the Argyll Fisheries Trust for additional sources of baseline information to inform the appraisal of effects on hydrology, hydrogeology and peat. Agreed the Ardchnonnal Wind Farm EIA ecology survey data is a reliable baseline to base the surveys and scope of the assessment for the Proposed Development. Agreed with the survey scope and the assessment methodology but recommended that cumulative effects are factored in at an early stage. Advised that the content of the draft Local Biodiversity Action Plan (LBAP) should be factored in to inform the ecological baseline. Advised further consultation should be undertaken with The Scottish Wildlife Trust, the Lorn Natural History Group and The Argyll Bird Club.	Extensive design work has been undertaken to avoid sensitive areas. Full details of the design are provided in Chapter 3 . The Argyll Fisheries Trust was contacted in March 2022 (see below). Cumulative effects are considered in this chapter. The LBAP has been consulted/examined and used to inform the ecology baseline where relevant. The Scottish Wildlife Trust was contacted as part of the EIA Scoping progress (see below). Further consultation was undertaken with the Lorn Natural History Group who advised that data could be obtained from the Argyll Biological Records Centre via the NBN Atlas.
Scottish Environment Protection Agency (SEPA) (17/11/2022)	Gatecheck Consultation Feedback	As well as avoiding deep peat the layout should also be shown to avoid any good quality peat-forming habitat, and a layout plan showing such areas should be included, if relevant. SEPA presume that a number of the larger areas of potential habitat may be found to be not groundwater dependant in that setting. SEPA feedback that the identification of GWDTE point features is good to see and that in many cases direct and indirect impacts on them have been	All of the points raised by SEPA have been covered within the following places of the EIA Report: ■ Figure 7.2: Watercourse Crossings and Buffers shows all watercourse buffer breaches (labelled). Appendix 7.1

Consultee and Date	Scoping/Other Consultation	Issue Raised	Response/Action Taken
		avoided. SEPA have requested that the schedule of mitigation should include specific measures to protect the habitats where this has not been possible. SEPA note that the report indicates that a 50m buffer has been applied around water features, but suggests that it's not possible to comply with it in all locations. SEPA have provided feedback that a detailed layout plan in relation to watercourse buffers isn't provided so it is difficult to see fully in which location it may not have been applied. It's noted that there are a number of small lochans or large bog pools on the Site and they should be protected in a similar manner. Working within the 50m buffer can be acceptable if it's shown to avoid impacts on other aspects that SEPA have an interest in – such as deep peat – as long as there are no known downstream sensitive receptors and additional mitigation is outlined in the schedule of mitigation. SEPA have requested that such areas should be clearly identified and justified.	Watercourse Crossings provides more detail on locations where the 50m buffer was not achieved, along with justification and additional mitigation, if required. ■ Figure 7.3: Ground Water Dependent Terrestrial Ecosystems (GWDTE) and Appendix 7.5: Ground Water Dependent Terrestrial Ecosystems (GWDTE) . ■ Figure 7.8: Peat Survey Results shows the infrastructure outline with peat depths on top and at a large enough scale to see probed depths
Non-Statutory Consultees			
Royal Society for the Protection of Birds (RSPB) (11/06/2021)	Formal Scoping Response	Requested full survey and assessment of important habitats on the Site. Noted the presence of Class 2 peatland within the Site and requested a full assessment of the carbon implications of the proposal using the Scottish Government Carbon Calculator. Recommended consideration is given to mitigation measures with respect to habitat loss and impacts on important species. Other points raised relate specifically to ornithology and are addressed in Chapter 9 .	NatureScot agreed with the proposed scope and assessment method. Detailed baseline habitat and protected species surveys have been undertaken (as per the proposed scope). Peatland habitats are assessed in detail in Chapter 7 . Embedded mitigation measures are presented in 'Design Considerations' below. The assessment will determine whether additional mitigation measures are necessary. An outline CEMP is submitted as part of the EIA Report. An Outline Restoration and Enhancement Plan (OREP) (Appendix 8.5) is submitted as part of this EIA Report.
Argyll Fisheries Trust (AFT) (29/03/2022)	Formal Scoping Response (after follow up email was sent 14/03/2022).	Advised stream spawning and juvenile nursery habitats associated with the lochs should be identified to ensure that: ■ Stream crossings do not affect the movement of both adult and juvenile fish between refuge	Fish surveys have not been undertaken to inform the EIA as agreed by NatureScot. Standard mitigation will be put in place to protect fisheries during construction and

Consultee and Date	Scoping/Other Consultation	Issue Raised	Response/Action Taken
		<p>habitat and spawning and nursery habitat; and</p> <ul style="list-style-type: none"> The spoil created by infrastructure works should be managed to avoid any impact on the condition of the habitat siltation or water quality. <p>Whilst some of the lochs have been stocked, AFT recommend that the trout populations be considered as wild brown trout in the absence of information concerning the origin or date of the fish stocking. This is because any effect of stocking may not be long lasting or have relevance to the conservation of existing stocks which are important in their own right, in addition to playing a key role in supporting local biodiversity.</p>	<p>operation of the Proposed Development (see 'Design Considerations', 'Micrositing' and 'Good Practice Measures' below).</p> <p>Details of watercourse crossings are included in Chapter 4.</p> <p>A CEMP has been prepared as part of the EIA Report, outlining these measures (see Appendix 4.2). Fisheries remain scoped out of this assessment.</p>
Argyll District Salmon Fishery Board (ADSFB) (23/05/2021)	Formal Scoping Response	<p>Commented that the Proposed Development has potential to affect salmon and trout populations and habitats.</p> <p>Recommended pre- and post-development surveys should be undertaken.</p>	<p>Fish surveys have not been undertaken to inform the EIA as agreed by NatureScot. Standard mitigation will be put in place to protect fisheries during construction and operation of the Proposed Development (see 'Design Considerations', 'Micrositing' and 'Good Practice Measures' below).</p>
Argyll District Salmon Fishery Board (ADSFB) (09/11/2022)	Gatecheck Consultation Feedback	<p>The report refers to ADSFB concerns over maintaining fish habitat and fish passage at stream crossings to comments made by NatureScot. ADSFB provided feedback that these comments do not appear to be detailed in the report, so they are unable to cross-check any comments made by NatureScot. ADSFB ask that the comments made by NatureScot are clearly shown in the report to allow ADSFB to identify specific comments made.</p> <p>ADSFB believe that 'standard mitigation' do not identify any specific characteristics of fish habitats (such as spawning sites and suitability or sensitivity of proposed stream crossing points) within the Site that may be critical to the conservation of fish populations. This approach does not provide ADSFB with any assurances that the developer will have demonstrated that they have not damaged or prevented access to fish habitats. While the developer may have the best intentions of protecting the water environment, delivery of projects by contractors may not always go to plan and ADSFB therefore need some mechanism to ensure that the Proposed Development does not impact on the fish populations or their habitat. ADSFB do not believe that 'standard mitigation' provides them with this assurance.</p> <p>ADSFB recommend that pre and post development surveys are undertaken to ensure that no damage</p>	<p>The requirements set out in the feedback from ADSFB have been achieved through the applicant committing to the below:</p> <ul style="list-style-type: none"> Embedded mitigation <ul style="list-style-type: none"> Use of bottomless arch or single span crossings wherever possible in the first instance. Retention/recreation of natural stream beds where possible. Closed pipes used as a last resort. Commitment to set any pipe culverts below the existing watercourse bed wherever possible and to make use of natural bed material. Pre-construction fish habitat surveys, to micro-site the crossings away from potentially

Consultee and Date	Scoping/Other Consultation	Issue Raised	Response/Action Taken
		<p>to habitats and fish populations have occurred as a result of the works and demonstrate that stream crossings have not prevented the movement of fish between habitats downstream and downstream of the crossings.</p>	<p>sensitive habitats wherever possible, and to confirm the habitat baseline within a buffer of up to 100m upstream and downstream (all watercourses are less than 4m wide).</p> <ul style="list-style-type: none"> Ecological Clerk of Works (ECoW) involvement during design, micrositing and construction of watercourse crossings. Post-construction fish habitat surveys and monitoring to ensure that mitigation measures are effective, that crossings maintain fish passage, and that potentially sensitive habitats are retained, and to identify any requirement for improvements or remedial works.
Scottish Wildlife Trust (SWT) (07/06/22)	Contacted by LUC (via email) to request any ecological records they hold to inform the assessment (as recommended by ABC).	SWT advised that they do not offer a data search service and that all their records are uploaded to NBN Atlas.	A data search using NBN Atlas has been undertaken as part of the desk study to inform this assessment.
Lorn Natural History Group (LNHG) (03/05/2022)	Contacted by LUC (via email) to request any ecological records they hold to inform the assessment (as recommended by ABC).	Advised that their partner organisation (Argyll Biological Records Centre) holds ecology data for the region and that it is freely available from the NBN Atlas.	A data search using NBN Atlas has been undertaken as part of the desk study to inform this assessment.

Study Area

8.21 The Study Area for this assessment is the Site plus relevant buffers as shown in **Figure 8.1** and **Figure 8.2**. The Study Area varies by ecological feature, as defined in **Table 8.2**.

Table 8.2: Study Area Descriptions

Ecological Feature	Study Area
Desk-based Studies	
Statutory Designated Sites	The Site and a 10km buffer
Non-Statutory Designated Sites	The Site and a 5km buffer

Ecological Feature	Study Area
Existing Protected Species Data	The Site and a 2km buffer (10km buffer for bats)
Field Studies	
Habitat and NVC Surveys	The Proposed Development with a 500m buffer of the infrastructure and a 250m buffer along the proposed access route, where land falls within the Site.
GWDTes	
Protected Species	The Proposed Development and a buffer up to 250m where survey methods dictate.
Bats	The Proposed Development and a buffer in line with guidance ² , comprising a buffer of 277.5m around proposed turbine locations and up to 100m along the proposed access route.

8.22 Detailed descriptions of the Study Area as it relates to each ecological feature are provided in **Appendix 8.1 to 8.4**.

Desk Based Research and Data Sources

8.23 A desk study was undertaken to identify known ecological features within the relevant study areas described in **Table 8.2** above. Searches were made for those habitats and species agreed through consultation, and the following resources were used:

- NatureScot's SiteLink Website¹¹;
- Scotland's Environment Mapping Service¹²;
- Lorn Natural History Group (LNHG)¹³;
- Argyll Biological Records Centre (ABReC)¹⁴;
- Argyll and Bute Council Local Biodiversity Action Plan (2010-2015)¹⁵;
- Argyll and Bute Council: A Biodiversity Technical Note for Planners and Developers¹⁶;
- The Carbon and Peatland Map¹⁷; and
- National Biodiversity Network (NBN) Atlas Scotland¹⁸.

8.24 Where appropriate, other scientific resources were referred to when determining protected species behaviour or population sizes. These resources are referenced in the chapter where appropriate.

8.25 Further information relating to the desk study methodology is provided in **Appendix 8.1**.

Field Survey

8.26 A suite of habitat and species surveys were undertaken to inform this assessment. Field surveys included:

- Phase 1 Habitat survey.
- National Vegetation Classification (NVC) survey of habitats of conservation interest³.
- Protected species surveys, including detailed searches for suitable habitat for, and direct evidence of the following species:
 - Otter;

- Water vole;
- Bats;
- Pine marten;
- Red squirrel; and
- Badger.

8.27 Incidental observations of other species of conservation interest³, including those scoped out of assessment through the Scoping process, were also recorded.

8.28 The majority of ecology field surveys were undertaken between April and September (the 'survey season') 2021 as described in the relevant appendices. Field surveys were undertaken in appropriate conditions and, where necessary, appropriate seasons. Detailed accounts of survey rationale and methods are provided in **Appendices 8.1 to 8.4**.

8.29 Due to uncertainty about the proposed access route, additional Phase 1 habitat and protected species surveys were undertaken in January and July 2022 along the route of potential access options. Whilst January is considered a sub-optimal time of year to undertake Phase 1 habitat surveys as there is a more limited range of plant species apparent, the area surveyed largely consisted of managed lowland habitats close to the town of Inveraray. As such, the species present were considered sufficient to characterise the habitats, and so this is not considered to be a significant limitation to the surveys.

Approach to GWDTes

8.30 The term 'Groundwater Dependent Terrestrial Ecosystem' (GWDTes) refers to wetland habitats that rely on groundwater for their function and viability. The concept evolved from the Water Framework Directive, transposed in Scotland through the Water Environment and Water Services Act (2003) (WEWS), and subsequent SEPA guidance.

8.31 SEPA guidance⁹ sets out those vegetation communities that at least potentially rely upon groundwater. Classification as a GWDTes does not convey any ecological value on a habitat; indeed, many GWDTes habitats are common and widespread across Scotland (e.g. rush mire). However, although GWDTes habitats are not necessarily of specific ecological value, WEWS and consequent guidance require GWDTes to be protected wherever possible.

8.32 SEPA guidance⁹ requires potential effects on GWDTes to be fully assessed and where necessary, mitigated. It is important to understand this context because to focus the assessment solely on the ecological value of GWDTes is not appropriate. The assessment of potential effects should focus on GWDTes as a proxy for groundwater movement, i.e. the assessment should focus on the effect of the Proposed Development upon the quality and quantity of groundwater supporting the GWDTes. Notwithstanding this, the ecological value of GWDTes in their own right must also be considered.

8.33 A short account of the identification methodology for potential GWDTes is presented in **Appendix 8.2**. Detailed assessment of GWDTes and potential effects on them is provided in **Chapter 7** and **Appendix 7.5: GWDTes Assessment**.

Assessing Significance

8.34 The assessment undertaken in this chapter is based on good practice methods described in CIEEM's 'Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater and Coastal'⁸.

8.35 The guidelines recommend that the 'Ecological Importance' of a given site in relation to each of its ecological features is determined within a defined geographical context. The geographical context as it relates to the Proposed Development, is described in **Table 8.3** below.

¹¹ NatureScot SiteLink Website [online]. Available at: <https://sitelink.nature.scot/home> [Accessed May 2022].

¹² Scottish Environment Protection Agency (n.d.) Scotland's Environment Map [online]. Available at: <https://map.environment.gov.scot/sewebmap/> [Accessed May 2022].

¹³ Lorn Natural History Group website. Available at: <http://lnhg.org.uk/> [Accessed June 2022].

¹⁴ Argyll Biological Records Centre website. Available at: <http://www.abrec.org.uk/> [Accessed June 2022].

¹⁵ Argyll and Bute Council. *Local Biodiversity Action Plan (2010-2015)*. Available online at: <https://www.argyll-bute.gov.uk/sites/default/files/planning-and-environment/AandB%20BAP%20Draft.pdf> [Accessed June 2022].

¹⁶ Argyll and Bute Council. *A Biodiversity Technical Note for Planners and Developers (February 2017)*. Available online at: https://www.argyll-bute.gov.uk/sites/default/files/biodiversity_technical_note_feb_2017_4.pdf [Accessed June 2022].

¹⁷ Scotland's Soils (2016) Carbon and Peatland Map [online]. Available at: <https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/> [Accessed June 2022].

¹⁸ National Biodiversity Network Atlas (n.d.) National Biodiversity Network Atlas, Scotland [online]. Available at: <https://scotland.nbnatlas.org/> [Accessed June 2022].

Table 8.3: Ecological Importance Criteria

Ecological Importance	Qualifying Criteria	Relevant Context
International	<p>A Site is considered of International ecological importance when it supports:</p> <ul style="list-style-type: none"> ■ An internationally designated site or candidate site (Special Protection Areas (SPA), potential SPA, Special Areas of Conservation (SAC), candidate SAC, possible SAC, Ramsar sites, proposed Ramsar sites or Biogenetic Reserve) or an area which NatureScot has determined meets the published selection criteria for such designations, irrespective of whether or not it has been notified. ■ A viable area of habitat type listed in Annex 1 of the Habitats Directive, or smaller areas of such habitat which are essential to maintaining the viability of that ecological resource at an international scale. ■ >1% of the European resource of an internationally important species, i.e. listed in Annex 1, 2 or 4 of the Habitats Directive. 	Europe
UK/National	<p>A Site is considered of UK/National ecological importance when it supports:</p> <ul style="list-style-type: none"> ■ A nationally designated site (Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Marine Nature Reserve) or a discrete area which NatureScot has determined meets the published selection criteria for national designation irrespective of whether or not it has yet been notified. ■ A viable area of a priority habitat referenced in the UK Post-2010 Biodiversity Framework or Scottish Biodiversity List (SBL), or smaller areas of such habitat which are essential to maintaining the viability of that ecological resource at a national scale. ■ >1% of the National resource of a regularly occurring population of a nationally important species i.e. a priority species listed in the SBL and/or Schedules 1, 5 (Section 9 (1, 4a, 4b)) or 8 of the Wildlife and Countryside Act 1981. 	UK/Scotland
Regional	<p>A Site is considered of Regional ecological importance when it supports:</p> <ul style="list-style-type: none"> ■ Non-statutory designated sites that represent a scale, or habitat/species assemblage, of value across a number of counties which are recognised in a regional context. ■ Non-designated sites that the designating authority has determined meet the published ecological selection criteria for designation, particularly large or representative habitat or species assemblages of importance at a regional level. ■ Viable and extensive areas of legally protected habitat/habitat identified in Regional BAP or County BAP, or smaller areas of such habitats that are essential to maintaining the viability of the resource at a regional scale. ■ Any regularly occurring populations of an internationally/nationally important species or a species in a relevant policy which is important for the maintenance of the regional meta-population. ■ Semi-natural ancient woodland greater than 0.25 hectares (ha). 	West Scotland
County	<p>A Site is considered of County ecological importance when it supports:</p> <ul style="list-style-type: none"> ■ County sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, e.g. Local Nature Conservation Sites (LNCS). ■ Viable areas of legally protected habitat/habitat identified in Council BAP or smaller areas of such habitats that are essential to maintaining the viability of the resource at a county scale. 	Argyll and Bute

Ecological Importance	Qualifying Criteria	Relevant Context
	<ul style="list-style-type: none"> ■ Any regularly occurring population of an internationally/nationally important species of species in a relevant UK/Council BAP which is important for the maintenance of the county meta-population. ■ Semi-natural ancient woodland smaller than 0.25ha. ■ Networks of species-rich hedgerows. 	
Local	<p>A Site is considered of Local ecological importance when it supports:</p> <ul style="list-style-type: none"> ■ Commonplace and widespread semi-natural habitats, e.g. scrub, poor semi-improved grassland, coniferous plantation woodland, intensive arable farmland, etc. which despite their ubiquity, contribute to the ecological function of the local area (habitat networks etc.). ■ Isolated or species poor stands of habitat of conservation interest which contribute to the viability of the resource at a local level. ■ Very small, but viable, populations of internationally/nationally important species or a species in a relevant UK/Council BAP which is important for the maintenance of the local meta-population. ■ Networks of linear features, including species-poor hedgerows. 	Study Area plus a 5km radius
Study Area (or Site) ¹⁹	<p>A Site is considered of Study Area ecological importance when it supports:</p> <ul style="list-style-type: none"> ■ Habitats of limited ecological value, e.g. amenity grassland, but which contribute to the overall function of the application Site's ecological functions. ■ Isolated or species-poor stands of habitats of conservation interest which do not contribute to the viability of the resource at a local level but create diversity within in the Study Area. ■ Very small, but viable, populations of internationally/nationally important species or a species in a relevant UK/Council BAP which do not contribute to the viability of the resource at a local level, but which contribute to diversity within the Study Area. 	Study Area

8.36 Following the assessment of ecological importance, likely significant effects are identified. This process involves the study of the proposed infrastructure layout, construction methods, proposed timescales, and operational requirements, with a view to identifying the pathways by which ecological features may be affected. Potential effects can be grouped into the following broad types:

- Direct habitat loss.
- Habitat fragmentation (disruption of ecological processes through fragmentation, isolation, and barriers to movement).
- Mortality (loss of life to habitats, species or qualifying features through direct contact or following pollution events, etc.).
- Disturbance (disruption to ecological processes through increased human presence, noise, vibration, etc.).

8.37 To determine significance, effects are considered with reference to the following parameters:

- Beneficial or adverse.
- Extent.
- Magnitude.
- Duration.
- Frequency.
- Reversibility.

¹⁹ For the purpose of this assessment, the Study Area is the ESA.

8.38 A degree of confidence, based on professional judgement, is used to assess the likelihood of an effect occurring. The following scale is referred to:

- Certain/Near-Certain: Probability estimated at ≥95%.
- Probably: Probability estimated at 50-95%.
- Unlikely: Probability estimated at 5-≤50%.
- Extremely Unlikely; Probability estimated at ≤5%.

8.39 Based on the combination of these parameters listed above, an effect is then considered to be either significant or not significant in the context of the EIA Regulations²⁰. An effect is considered to be significant if it has the potential to affect the integrity of a habitat or the conservation status of a species. Technical definitions of integrity and conservation status follow CIEEM guidelines⁹.

8.40 The significance of a potential effect is considered, using professional judgement, within the context of the geographically based ecological importance of the feature. For example, the significance of a potential effect on a habitat of Local ecological importance is considered to be significant, or not significant, at a Local level. In some cases, where only a small part of an ecological feature is affected, the potential effect may be significant at a lower geographical level; for example an effect deemed to be significant on a feature of Local ecological importance may be only considered significant at the Site level.

8.41 The EIA assessment process generally requires that the significance of an effect is described as either 'Major', 'Moderate', 'Minor' or 'Negligible'. However, best practice guidance in relation to EIA does not support this approach, due to the complexities of ecological processes.

8.42 To allow the potential effects identified in this EIA to be considered alongside those addressed in other topic chapters, a 'translation' from EIA significance to EIA significance has been undertaken, as described in **Table 8.4** below. The translation relates the geographically based significance of ecological effects (identified through the EIA process) to the standard terminology for significance presented in other chapters (following the EIA process), allowing direct comparison.

8.43 Effects of **Major** and **Moderate** significance are considered 'significant' in the context of the EIA Regulations.

Table 8.4: Ecological Effect 'Significance' Translation to EIA Terminology

EIA Significance Terminology	Corresponding EIA Effect Significance Terminology
Major	International/European
	UK/National
Moderate	Regional
	County
Minor	Local
	Study Area
Negligible	Not Significant

Identifying Mitigation and Assessing Residual Significance

8.44 Where likely significant effects are identified, mitigation measures are proposed to alleviate their significance as far as is possible. The standard mitigation hierarchy applies, whereby the following sequential measures are considered:

- Avoidance: The effect is avoided by removing its pathway, e.g. by changing the route of an access track. This is most often achieved during the iterative design process.

- Mitigation: Measures are taken to reduce the significance of the effect, e.g. vegetation clearance is undertaken outside the nesting bird season to avoid effects on nesting birds.
- Compensation: Where the effect cannot be avoided or reduced, alternative action is taken elsewhere within the Site/Proposed Development boundary, e.g. a Habitat Management Plan that brings retained habitat into better condition.

8.45 Using the assessment method described above, significant effects are re-assessed on the basis that mitigation measures will be applied, and a residual significance identified. An important part of this step is the identification of the likely success, or confidence in, the proposed mitigation measure.

Assessment Limitations

8.46 There is a gap in the vegetation survey data in the west of the ESA; this is due to the re-location of a met mast to this location. As such, the survey data extends to a small watercourse approximately 200m north-west from the infrastructure footprint around the met mast. The habitats within the vicinity of the met mast largely comprise bog and acid grassland. The habitats beyond the watercourse are therefore unlikely to be impacted by the met mast, and so this is not considered a significant limitation to the assessment. The extent of the gap in survey area can be seen on **Figure 8.3**.

8.47 All areas of woodland and forestry were surveyed for evidence of protected species where possible. Areas which posed a health and safety risk (such as wind-blown trees or dense plantation) were not surveyed in full. However, a cautious approach was taken to reduce the effects of any health and safety survey gaps by surveying these areas from a distance, therefore it is considered unlikely that any small data gaps will have implications for the outcome of this assessment.

8.48 No bat roost surveys have been undertaken of individual trees to be removed during the construction phase as,; wherever possible, the removal of mature trees has been avoided through the use of the existing track. Furthermore, the appointed contractor may require to change felling, trimming or pruning requirements to respond to site conditions when works commence. As such, bat roost surveys of trees which may be affected will be undertaken prior to the commencement of construction. If bat roosts are identified, the licensing process for roosting bats will be engaged. This is considered an appropriate response as bat tree roosts can often be transient and open to considerable change due to the effects of weather on suitable features.

8.49 One bat detector in summer did not yield any data due to a technical fault. As a result, data from only 14 locations was recorded, rather than 15 locations as in spring and autumn. Despite this failure, there were still more automated static bat detectors (14) than turbines (13); therefore, the surveys conform to NatureScot guidance². Furthermore, the location of the failed bat detector is no longer proposed for a turbine. This gap in the summer survey data is therefore not considered to be a limitation to the assessment.

8.50 During bat sound analysis, *Myotis* spp. and a number of *Pipistrellus* spp. calls were only identified to genus rather than species level due to the difficulty in identifying these genera to species via sound analysis. The number of *Pipistrellus* spp. calls that were only identified to genus was relatively large, and this is taken into consideration in the assessment (see **Appendix 8.4**). Given that the mitigation for species in each genus will be consistent, regardless of which species was recorded, this is not considered a limitation to this assessment.

8.51 Ecological surveys are limited by a variety of factors which affect the presence of flora and fauna: for example, climatic variation, seasonal and species behaviours may mean that evidence of protected species is not always recorded during a survey. This does not mean that a species is absent, hence the surveys also record and assess the ability of habitats to support species. All ecological surveys provide only a snapshot of activity and cannot be used for long-term interpretation.

8.52 Within these constraints, the authors are confident that the baseline data collected has allowed a robust and thorough assessment of potential effects. A further account of limitations, where relevant to each appendix, is provided in **Appendices 8.1 to 8.4**.

8.53 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.

²⁰ Environmental Impact Assessment (EIA) under The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended).

Existing Conditions

Desk Study

Designated Sites

8.54 Table 8.5 lists the statutory designated sites identified within 10km of the Site, and non-statutory designated sites identified within 5km of the Site. Special Protection Areas (SPAs), which are designated for their ornithological interest, are detailed in **Chapter 9**. Similarly, Sites of Special Scientific Interest (SSSIs) for which only ornithological interests qualify, are listed only within **Chapter 9**. Designated Sites are illustrated in **Figure 8.2**.

Table 8.5: Designated Sites

Site Name	Designation	Approx. Distance and Orientation from the Site	Qualifying Feature(s)
Statutory Sites (within 10km)			
Dalavich Oakwood	SSSI	2.6km west	Upland oak woodland, wet woodland
Ardchylne Wood	SSSI	3.0km south-east	Upland oak woodland
Glen Shira	SAC	7.4km north-east	Western acidic oak woodland
Beinn an Lochain	SSSI	8.5km east	Siliceous scree (includes boulder fields), tall herb ledge, upland assemblage
Non-Statutory Sites (within 5km)			
Coille Bhraghaid and other unnamed areas of woodland	Ancient Woodland	Within the Site (in the east)	Woodland
Numerous other areas of unnamed woodland	Ancient Woodland	Widespread within the 5km search area	Woodland

8.55 Based on the qualifying features of the statutory designated sites, the distance from the Site, lack of structural or functional connectivity between the Proposed Development and the sites, and the nature of the Proposed Development, it is unlikely that there will be any adverse environmental effects. Therefore, effects as a result of construction or operation on statutory designated sites have been scoped out of this assessment.

8.56 Woodland in the east of the Site, along the existing access track, is listed on the Ancient Woodland Inventory (AWI)²¹. There are three blocks which are listed as Ancient (of semi-natural origin) including the only named block, Coille Bhraghaid. However, all of these are described in the Native Woodland Survey of Scotland (NWSS)²² as woodland planted on ancient woodland sites (PAWS) and are dominated by non-native tree species. The remaining blocks are listed as Long-established (of plantation origin; LEPO). These woodlands are along the existing access track which forms most of the proposed access route. Furthermore, these woodlands form part of the commercial forestry of Argyll Estate and so are subject to rotational felling and replanting.

8.57 Approximately 3.2ha of woodland listed on the AWI is proposed to be felled; the majority of this (2.2ha) comprises non-native conifer species, leaving approximately 1.0ha of broadleaved trees proposed for felling. However, only approximately 0.2ha of this includes trees planted pre-1900, with the remaining extent (0.8ha) assessed to be trees planted from 1950 onwards. As such, a small number of mature broadleaved trees, including native oak *Quercus* sp. and ash *Fraxinus excelsior* and non-native beech *Fagus sylvatica*, may be affected by felling or limbing. The majority of these trees were not considered during field surveys to be veteran²³; one beech and one ash were noted within the proposed felling parcels to exhibit features indicative of veteran status. Whilst these

trees should be retained wherever possible, in the context of EclA and EIA, this is not anticipated to equate to a likely significant effect.

8.58 In addition, there are numerous further blocks of woodland listed on the AWI within 5km of the Site, several of which are functionally connected to the Site via the blocks along the access route. However, assuming good practice measures are observed in construction, adverse effects on woodland blocks outwith the Site are considered unlikely.

8.59 There are no Ramsar sites, National Nature Reserves (NNRs) or Local Nature Reserves (LNRs) within 10km of the Site, and no Local Nature Conservation Sites (LNCS) within 5km of the Site.

8.60 For the reasons stated above, effects on statutory and non-statutory designated sites have been scoped out of this assessment and are not discussed further within in this chapter.

Existing Records of Protected Species

8.61 A search of NBN Atlas¹⁸ returned the following protected species records within 2km and 10km (bat species) of the Site (see **Table 8.6** below).

Table 8.6: NBN Atlas Scotland Protected Species Data Search Results

Species	Number of records	Year of most recent record	
Otter	1	2014	
Red squirrel	43	2021	
Pine marten	1	2020	
Harbour seal	1	2020	
Bats	Common pipistrelle	17	2016
	Soprano pipistrelle	2	2014
	Unidentified pipistrelle species	1	2007
	Daubenton's bat	1	2014

8.62 Further information relating to the desk study is provided in **Appendix 8.1**.

Field Study

8.63 A summary of field study findings is presented below. Detailed accounts of methods adopted, survey findings and interpretation can be found in **Appendices 8.2 to 8.4**.

Site Description

8.64 The Site is located between Loch Fyne (to the east) and Loch Awe (to the west) in Argyll and Bute, Scotland. Turbine 1 (T1) of the Proposed Development is the closest to Inveraray, located approximately 6km to the north-west, and T13 is the closest to Dalavich, approximately 4.5km to the east. The turbines and associated infrastructure lie on an exposed, undulating, moorland plateau, devoid of trees, with linear ridges of rock which creates a 'ridge and furrow' landscape. Blanket bog is the dominant habitat, often recorded in mosaic with heathland and acid grassland due to the complex topography.

²¹ NatureScot (no date). A guide to understanding the Scottish Ancient Woodland Inventory (AWI). Available at: <https://www.nature.scot/doc/guide-understanding-scottish-ancient-woodland-inventory-awi> [Accessed October 2022].

²² Forestry Commission Scotland (2014) Scotlan'd Native Woodlands: Results from the Native Woodland Survey of Scotland.

²³ The Woodland Trust (2008). Ancient tree guide 4: What are ancient, veteran and other trees of special interest? The Woodland Trust, Grantham.

8.65 Trees are absent from the turbines and associated infrastructure and the majority of the access route; however the east of the Site is occupied by commercial plantation forestry dominated by Sitka spruce *Picea sitchensis*, through which access will be taken. Commercial forestry borders much of the Site to the south and west, and partially to the north.

8.66 Owing to its complex topography, the Site is pitted with numerous lochs and lochans, from which emanate many watercourses which flow off the Site. The most notable are the Allt Blarghour which runs east-west close to the northern boundary, and the Eas an Amair which flows north-south through the western portion of the Site.

8.67 The Site is grazed by both sheep and deer, and there is evidence of this grazing in the habitat composition across the non-forested areas of the Site.

Habitats and Vegetation

Phase 1 Habitat Survey

8.68 Detailed Phase 1 Habitat descriptions are provided in **Appendix 8.2** while a Phase 1 Habitat Survey map is presented in **Figure 8.3**. A summary of the habitats recorded within the ESA is provided in **Table 8.7** below.

8.69 The majority of the Site has a complex habitat composition due to its topography. However, the eastern portion of the Site is dominated by commercial forestry along the access track and therefore has a much more uniform habitat composition.

8.70 In the west of the Site, the land that comprises the ESA is dominated by extensive areas of habitat mosaics, the principal components of which were blanket bog, wet and dry dwarf shrub heath, and acid grassland. Wet heath was often recorded in intimate mosaic with blanket bog, often in response to varying peat depth, while dry heath was generally noted on drier, steeper slopes. A complex network of watercourses and lochans is present throughout this area. A similar mosaic of habitats exists along the proposed access route between the area of proposed turbines and the edge of the forestry plantation to the east. Bog habitats account for approximately 600ha (46%) of the ESA²⁴. On the open ground, wet heath was the next most common heathland habitat accounting for approximately 70ha (5%) of the ESA.

8.71 The eastern extent of the Site largely comprises an existing access track through commercial forestry, and so the Site here is dominated by plantations of Sitka spruce of varying ages, with patches of broadleaved woodland on the edges of larger blocks of forest and along watercourses within the plantation. Coniferous plantation accounts for approximately 190ha (14%) of the ESA. The existing track extends from a wayleave near the western edge of the commercial forestry to the junction with the A819. A further extent of existing track passes through the eastern edge of the commercial forestry from the A819 just west of Inveraray to the A83 to the south of the village, although the habitats here are more variable, with extents of both mixed woodland and recently felled coniferous plantation.

8.72 Acid grasslands are present on steeper, drier slopes and the tops of rocky ridges and hillocks, and accounts for approximately 190ha (14%) of the ESA.

8.73 Flushes (both acid and basic) were identified across the ESA but accounted for a very small proportion of the habitats. Acid flushes were characterised by *Sphagnum fallax*, overlain by star sedge *Carex echinata*, sundew *Drosera* spp. and violets *Viola* spp. Basic flushes identified were typically recorded in small, narrow, stony gullies on steep slopes and species recorded included a range of sedge *Carex* species, butterwort *Pinguicula vulgaris*, and yellow saxifrage *Saxifraga aizodes*. Bryophyte-dominated springs were identified in some of these flushes and were dominated by moss species including *Philonotis fontana* and *Dicranella palustris*. The extent of these flushes and springs was very small and therefore often not possible to map.

8.74 A total of 28 Phase 1 habitat categories were recorded within the ESA which translate into 21 NVC communities. **Table 8.7** provides a summary of the Phase 1 habitats within the ESA, with their absolute area and relative proportions.

Table 8.7: Phase 1 Habitat Classifications and Proportions²⁵

Phase 1 Habitat		Area	
Code	Title	Absolute (ha)	Relative % (1dp)
A1.1.1	Broadleaved woodland (semi-natural)	27.2	2.1
A1.2.2	Coniferous woodland (plantation)	187.6	14.4
A1.3.1	Mixed woodland (semi-natural)	20.0	1.5
A1.3.2	Mixed woodland (plantation)	4.8	0.4
A2.1	Scrub (dense)	1.6	0.1
A2.2	Scrub (scattered)	2.4	0.2
A3.1	Broadleaved scattered trees	9.6	0.7
A3.3	Mixed scattered trees	2.0	0.2
A4.2	Recently-felled woodland (coniferous)	13.8	1.1
A4.3	Recently-felled woodland (mixed)	29.0	2.2
B1.1	Acid grassland (unimproved)	38.7	3.0
B1.2	Acid grassland (semi-improved)	36.2	2.8
B2.2	Neutral grassland (semi-improved)	2.0	0.2
B4	Improved grassland	11.0	0.8
B5	Marshy grassland	64.7	5.0
C1.1	Bracken (continuous)	2.0	0.2
C1.2	Bracken (scattered)	29.8	2.3
D1	Dry dwarf shrub heath	26.9	2.1
D2	Wet dwarf shrub heath	31.7	2.4
D5	Dry heath/acid grassland mosaic	26.2	2.0
D6	Wet heath/acid grassland mosaic	75.1	5.8
E1.6.1	Blanket bog	567.6	43.5
E1.7	Wet modified bog	35.0	2.7
E2.1	Acid/neutral flush	n/a	n/a
E2.2	Basic flush	n/a	n/a
E2.3	Bryophyte-dominated spring	n/a	n/a

²⁴ This figure is based on combining Phase 1 habitat types E1.6.1 and E1.7; when using NVC communities and their corresponding proportions, including NVC community M25 which may otherwise be recorded primarily as Phase 1 habitat B5, the figure is approximately 660ha of bog communities.

²⁵ Habitats that are recorded as point features, such as bryophyte-dominated springs, have not been assigned an area and are not included in the table.

Phase 1 Habitat		Area	
Code	Title	Absolute (ha)	Relative % (1dp)
E4	Peat (bare)	21.7	1.7
G1	Standing water	25.8	2.0
G2	Running water	0.7ha / 54km	0.1
I2.1	Quarry	0.7	0.1
J4	Bare ground / Hardstanding	0.2	<0.1

National Vegetation Classification (NVC)

8.75 Detailed NVC descriptions are provided in **Appendix 8.2**, and mapped in **Figure 8.4**.

8.76 NVC is a more detailed and precise means of describing vegetation communities than Phase 1 Habitat nomenclature. NVC is reported where habitats of conservation interest were identified, and their extent and species assemblage was of sufficient quality to identify and map. Habitats of conservation interest³ identified within the ESA include:

- Habitats considered conservation priorities in the Habitats Directive (i.e. Annex 1 habitats).
- Habitats considered to be potentially groundwater dependent.
- Habitats included on the Scottish Biodiversity List (SBL).
- Habitats included in Argyll and Bute Local Biodiversity Action Plan 2010-2015.

8.77 As described in **Appendix 8.2**, and illustrated in **Figure 8.4**, not all habitats identified using the Phase 1 codes have a corresponding NVC code. However, habitats of likely conservation interest were subject to NVC. Habitats that do have NVC codes are summarised in **Table 8.8** below.

Table 8.8: Phase 1 Habitat and NVC Translation

Phase 1 Habitat Code		Mechanism for Habitat of Conservation Interest	Relevant NVC Classification	
Code	Title		Code	Title
A1.1.1	Broadleaved woodland (semi-natural)	Potential GWDTE SBL (Wet Woodland) Argyll and Bute LBAP	W4	<i>Betula pubescens-Molinia caerulea</i> woodland
B1	Acid grassland (unimproved and semi-improved)	n/a	U4	<i>Festuca ovina-Agrostis capillaris-Galium saxatile</i> grassland
		n/a	U5	<i>Nardus stricta-Galium saxatile</i> grassland
		Potential GWDTE	U6	<i>Juncus squarrosus-Festuca ovina</i> grassland
B5	Marshy grassland	Potential GWDTE SBL (Upland Flushes, Fens and Swamps) Argyll and Bute LBAP	M23	<i>Juncus effusus/acutiflorus-Galium palustre</i> rush-pasture
		Potential GWDTE	M25	<i>Molinia caerulea – Potentilla erecta</i> mire

Phase 1 Habitat Code		Mechanism for Habitat of Conservation Interest	Relevant NVC Classification	
Code	Title		Code	Title
C1	Bracken (continuous and scattered)	n/a	U20	<i>Pteridium aquilinum – Galium saxatile</i> fern community
D1	Dry dwarf shrub heath	Annex 1 Habitat (H4030 European dry heaths) SBL (Upland Heathland) Argyll and Bute LBAP	H10	<i>Calluna vulgaris-Erica cinerea</i> heath
			H12	<i>Calluna vulgaris-Vaccinium myrtillus</i> heath
			H21	<i>Calluna vulgaris-Vaccinium myrtillus-Sphagnum capillifolium</i> heath
D2	Wet dwarf shrub heath	Annex 1 Habitat (H4010 Northern Atlantic wet heaths with <i>Erica tetralix</i>) Potential GWDTE SBL (Upland Heathland) Argyll and Bute LBAP	M15	<i>Trichophorum germanicum-Erica tetralix</i> wet heath
E1.6.1	Blanket bog	Annex 1 Habitat (H7130 Blanket bogs) SBL (Blanket Bog) Argyll and Bute LBAP	M2	<i>Sphagnum cuspidatum/fallax</i> bog pool community
			M3	<i>Eriophorum angustifolium</i> bog pool community
			M17	<i>Trichophorum germanicum-Eriophorum vaginatum</i> blanket mire
			M19	<i>Calluna vulgaris-Eriophorum vaginatum</i> blanket mire
			M20	<i>Eriophorum vaginatum</i> blanket and raised mire
E1.7	Wet modified bog	As above Potential GWDTE	M20	<i>Eriophorum vaginatum</i> blanket and raised mire
			M25	<i>Molinia caerulea – Potentilla erecta</i> mire
E2.1	Acid/neutral flush	Potential GWDTE SBL (Upland Flushes, Fens and Swamps) Argyll and Bute LBAP	M6	<i>Carex echinata-Sphagnum fallax/denticulatum</i> mire
E2.2	Basic flush	Annex 1 Habitat (H7230 Alkaline fens: M10 only) Potential GWDTE SBL (Upland Flushes, Fens and Swamps) Argyll and Bute LBAP	M10	<i>Carex dioica-Pinguicula vulgaris</i> mire
			M11	<i>Carex viridula ssp. oedocarpa-Saxifraga aizoides</i> basic spring and flush

Phase 1 Habitat Code		Mechanism for Habitat of Conservation Interest	Relevant NVC Classification	
Code	Title		Code	Title
E2.3	Bryophyte-dominated spring	Potential GWDTE SBL (Upland Flushes, Fens and Swamps) Argyll and Bute LBAP	M32	<i>Philonotis fontana-Saxifraga stellaris</i> spring

8.78 In addition to the habitats listed in the table above, the waterbodies (G1 Standing water) and watercourses (G2 Running water) within the ESA qualify as habitats of conservation interest as SBL priority habitats; the larger lochans qualify as Oligotrophic and Dystrophic Lakes while smaller bog pools qualify as part of the Blanket Bog priority habitat, and the watercourses qualify as the Rivers priority habitat.

Groundwater Dependent Terrestrial Ecosystems (GWDTEs)

8.79 Nine NVC communities were recorded which, according to SEPA guidance⁹, may indicate groundwater dependency. **Table 8.9** summarises the NVC communities of those potential GWDTEs. The two right-hand columns note the potential groundwater dependency according to the guidance, with the far right-hand column providing the outcome of an assessment of likely groundwater dependency (with verification via hydrological survey) based on the actual onsite condition, habitat assemblage and topography. Hydrological survey confirmed the actual groundwater dependency of the NVC communities potentially affected by the Proposed Development, as detailed in **Table 8.9** and **Chapter 7**.

Table 8.9: Potential and Actual Groundwater Dependency

Potential GWDTE NVC Code		Groundwater Dependency	
Code	Title	Guidance	Actual
M6	<i>Carex echinata-Sphagnum fallax/denticulatum</i> mire	High	Moderate, and Low to Moderate
M10	<i>Carex dioica-Pinguicula vulgaris</i> mire	High	High
M11	<i>Carex viridula ssp. oedocarpa-Saxifraga aizoides</i> basic spring and flush	High	High
M15	<i>Trichophorum germanicum-Erica tetralix</i> wet heath	Moderate	Low, limited areas Moderate
M23	<i>Juncus effusus/acutiflorus-Galium palustre</i> rush-pasture	High	Low
M25	<i>Molinia caerulea-Potentilla erecta</i> mire	Moderate	Low
M32	<i>Philonotis fontana-Saxifraga stellaris</i> spring	High	High
U6	<i>Juncus squarrosus-Festuca ovina</i> grassland	Moderate	Low
W4	<i>Betula pubescens-Molinia caerulea</i> woodland	High	Not GWDTE

Peatland Condition

8.80 The peatland within the open range in the west of the ESA is classified as Class 2²⁶, and is considered to be indicative of areas of potentially high conservation value and restoration potential.

8.81 The peatland condition varied across the ESA, with pockets of 'near natural', and large extents of 'modified'. Areas were also noted to be 'drained' and 'actively eroding'. There was evidence of grazing noted but no evidence of burning across the ESA. Details are provided in **Appendix 8.2**.

8.82 The peatland condition therefore comprises a mosaic of peatland conditions, with large extents showing a significant degree of modification and erosion, and presenting opportunities for restoration and enhancement. Further details on peat are provided in **Chapter 7** of the EIA Report.

Protected Species

Bats

8.83 The desk study returned no records of bats within the Site and 21 from within 10km.

8.84 The BSA was considered to have limited potential to support roosting bats. In the west, this is due to the dominance of bog and heath habitats; this area lacked trees or structures with features offering suitability for roosting bats. In the east along the proposed access route where woodland is present, conifer plantations of varying ages were the dominant habitat, and these trees generally lacked potential roost features such as cracks in the trunks or limbs and knot holes.

8.85 Six mature broadleaved trees were recorded within the Site which offered from Moderate to High bat roost potential; these trees were all located near a disused quarry along the existing access track near Inveraray, and were over 5km from the nearest turbine. The remaining trees along the access route had from Negligible to Low bat roost potential. Details are provided in **Appendix 8.4**.

8.86 The trees noted as having Moderate to High bat roost potential are all located adjacent to the proposed access route and may therefore require felling or removal of limbs to facilitate access to the Proposed Development. While these trees may support roosting bats, pre-construction surveys and the application of the CEMP (including adhering to licensing requirements as necessary) will ensure any roosts to be lost are appropriately mitigated. More extensive mature broadleaved woodland is known to be present in the wider area and is expected to offer additional roosting opportunities.

8.87 In addition, an old stone building was recorded near the disused quarry and was assessed to offer Low bat roost potential. The building is approximately 40m from the proposed access route and so will not be affected.

8.88 Field studies comprised automatic static bat detector sample and analysis. A total of 15 static detectors were deployed for a minimum of 14 consecutive nights during each of the three 2021 survey seasons (i.e. Spring: April/May; Summer: June/July/August; Autumn: September/October).

8.89 Surveys identified the following species within the BSA:

- Common pipistrelle *Pipistrellus pipistrellus*;
- Soprano pipistrelle *Pipistrellus pygmaeus*;
- Unknown *Pipistrellus* spp.;
- Brown long-eared *Plecotus auritus*; and
- *Myotis* spp.

8.90 Some calls of *Myotis* and *Pipistrellus* species could not be identified to species level, therefore they have been identified to genus level only (see **Assessment Limitations** above).

8.91 Bat activity varied according to the location within the BSA, by the season and by species or species group. By far the highest level of activity was recorded at a detector immediately adjacent to an unnamed lochan in the west of the BSA. Levels across the rest of the Site were much lower, although relatively higher activity levels were recorded in the north-west of the Site where detectors were deployed across relatively flatter, lower-lying ground; in this area the habitats are dominated by blanket bog with a network of watercourses and lochans. Pipistrelle bats were by far the most common genus recorded, accounting for 92.9% of all passes recorded during the static surveys.

²⁶ Scottish Natural Heritage (2016) 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>

8.92 It should be noted that due to the iterative design process, static bat detectors were placed in locations that are no longer proposed for turbines. The data collected from these locations were therefore used to understand the bat activity level across the whole Site, providing additional information on the local bat population and how bats use the Site in its entirety.

8.93 The Site is considered to have 'Low' habitat risk status to bats, as defined by best practice guidelines²⁷; this is due to the small number of potential roost features, the relatively low quality foraging habitat within the Site, and the isolation with a lack of prominent linear features to connect it to the wider landscape. The project size is defined as 'Large' due to the maximum blade tip height (180m) and the presence of other wind energy developments within 5km². Therefore the Site risk level for collision effects on bats is 'Medium'².

8.94 The only high collision risk species recorded during the surveys are pipistrelle bats. The results of the analysis indicate that the Typical Risks²⁷ to these species are 'Medium', while the Peak Risks²⁸ are 'High'².

8.95 Full results and data analysis are provided in **Appendix 8.4** and **Figures 8.7** and **8.8**.

Otter

8.96 The desk study returned no records of otter within the Site, although one record was present within 2km.

8.97 Watercourses within the ESA varied in their suitability to support otter. The Eas an Amair in the west of the ESA and the Allt Blarghour along the northern boundary of the Site are two of the larger watercourses, and both offer suitable conditions for commuting, and foraging. The network of watercourses, and both larger named lochs and smaller unnamed lochans set within a extents of blanket bog and wet heath habitats, offer foraging opportunities and routes for commuting through the ESA.

8.98 Spraints were noted on the Eas an Amair, on a smaller watercourse flowing into Loch Sionnaich, and on the Steallaire Bàn Loch on the edge of forestry plantation. No resting-up sites were identified, and the ESA offered limited opportunities for shelter, particularly in the open bog and heathland habitats in the west.

8.99 Further details from the otter survey are provided in **Appendix 8.3** and **Figure 8.6**.

Badger

8.100 The desk study returned no records of badger within 2km of the Site.

8.101 The habitats within the ESA were generally considered to be unsuitable to support badger. The majority of the ESA, particularly to the centre and west, comprised of exposed heathland and bog habitats. These areas are unsuitable for badger as they are wet, boggy, and exposed due to an absence of tree and shrub cover.

8.102 Some limited suitable foraging habitat (including improved grassland and mixed woodland) was recorded in the very east of the ESA, along the proposed access route.

8.103 While the coniferous plantation forest within the east of the ESA provided more cover and sheltering opportunities for the species, the general structure of the forestry does not provide suitable conditions, and the generally wet ground conditions would be unsuitable for sett construction.

8.104 However, it was not possible to survey some denser areas of forestry (see **Assessment Limitations** section). While no evidence of badger was recorded, the presence of badger in plantation forestry in the east of the ESA, albeit at low density, cannot be ruled out.

8.105 Further detail of the badger survey is provided in **Appendix 8.3**.

Red Squirrel

8.106 The desk study returned one record of red squirrel from within the Site and a further 42 from within 2km.

8.107 Habitats within the ESA vary in their suitability to support red squirrel. Coniferous plantation forest within the east of the ESA provides suitable cover for red squirrel. However, the general age and structure of the forestry provide sub-optimal conditions as it is dominated by semi-mature Sitka spruce.

8.108 Pockets of mixed woodland are present along the proposed access route. These areas are more suitable for red squirrel due to the diversity and age of the tree species recorded there.

8.109 Two red squirrels were recorded along the proposed access route (**Figure 8.6**); two squirrels were seen chasing each other up and down trees at the northern end near the A819. No dreys were observed and no further signs of red squirrel were recorded.

8.110 The centre and west of the ESA is considered unsuitable for red squirrel due to a lack of woodland cover.

8.111 Further detail of the red squirrel survey is provided in **Appendix 8.3** and **Figure 8.6**.

Pine Marten

8.112 The desk study returned no records of pine marten within the Site, although one record was present within 2km.

8.113 Habitats within the ESA were considered to provide some suitability to support breeding populations of pine marten. The ESA has areas dominated by coniferous plantation forestry in the east, and therefore it is likely to provide some suitable opportunities for shelter and foraging. However, the conifer forest generally lacked suitably mature trees which are more likely to offer cavities for denning.

8.114 The more open, predominantly boggy landscapes of the central and western areas of the ESA provide very limited suitable habitat for foraging, commuting or dens.

8.115 Two pine marten scats were recorded in plantation forestry in the east of the ESA within 250m of the proposed access route (**Figure 8.6**).

8.116 Outwith the ESA, a further two pine marten scats were recorded in plantation forestry to the south, and an incidental sighting of a pine marten was noted near Loch Awe to the west.

8.117 It was not possible to survey some areas of forestry within the ESA due to its dense nature (see **Assessment Limitations** section). The forest habitat is not considered a high-value resource for pine marten as it lacks the structural complexity favoured by this species. However, commercial forestry is extensive and well-connected in the east of the ESA where pine marten scats were recorded. In addition to the sighting of the species to the west, the presence of pine marten in the area and within the ESA itself is confirmed, albeit the species is likely to be at a low density.

8.118 Further detail of the pine marten survey is provided in **Appendix 8.3** and **Figure 8.6**.

Water Vole

8.119 The desk study returned no records of water vole within 2km of the Site. However, previous survey work undertaken for the Ardchnonnel Wind Farm Environmental Statement confirmed that water vole is present within the Site²⁹.

8.120 The ESA contains optimal habitat for water vole, with many of the watercourses providing abundant foraging resources and opportunities for concealment and protection. Peaty, sloped banks suitable for burrow excavation were present across the ESA. Particularly favourable habitat was recorded along stretches of slow-moving watercourses in the centre and north-western areas of the ESA, notably along the Eas an Amair.

8.121 Field signs recorded within the ESA include burrows, runs, feeding signs and a latrine (**Figure 8.6**). Signs were located on the Eas an Amair in the west of the ESA, the Allt Blarghour and one of its unnamed tributaries in the north, and on the Altan Airigh Mhic Choinnich which flows from the ESA into forestry to the east.

8.122 Details of water vole evidence are provided in **Appendix 8.3** and **Figure 8.6**.

Notable Species

8.123 Numerous habitats common across the ESA, particularly wet heath, bog and marshy grassland, are considered suitable for common species of amphibians such as common toad *Bufo bufo* and common frog *Rana temporaria*. Although no sightings were recorded, these species are expected to be present within the ESA.

²⁷ Typical Risk is the risk posed to a species by the Proposed Development based on the mean activity levels of that species, and is used to determine the likely general effect of the Proposed Development on each species.

²⁸ Peak Risk is the risk posed by the Proposed Development based on the highest recorded activity level of that species, and is used to identify the highest risk posed by the Proposed Development to account for peaks in bat activity.

²⁹ The Ardchnonnel Wind Farm Environmental Statement is available online on the Argyll and Bute Council planning portal <https://publicaccess.argyll-bute.gov.uk/online-applications/>, reference 13/02835/PP, appeal reference PPA-130-2045.

8.124 Habitats within the ESA, such as heathland and acid grassland, are considered suitable for common species of reptile. Four common lizards *Zootoca vivipara* were recorded within blanket bog and acid grassland habitats within the north of the ESA (**Figure 8.6**). In addition, adder *Vipera berus* would be expected to be present in the wider area and is likely within the ESA.

8.125 While the above notable species have been recorded are expected to be present within the ESA, effects upon these species are considered unlikely to be significant due to their life-histories. As such these species have been scoped out of assessment, although site-wide mitigation to protect incidental species will be addressed in the CEMP and Species Protection Plans (SPPs).

Implications of Climate Change

8.126 The predicted effects of climate change are likely to have a bearing on the future ecological status of the Site. The UK Climate Projections (most recently UKCP18³⁰) generally predicts hotter, drier summers and milder, wetter winters, with an increase in the number of heavy rain days and in the frequency of winter storms.

8.127 These predicted changes in climate may result in changes to vegetation assemblages; however, it is unlikely that climate change will have a significant bearing on the structure and function of the upland habitats present within the Proposed Development and surrounding area.

8.128 However, individual species may be adversely affected by the predicted changes in climate if conditions affect the survival rate of the animals at a critical life stage (such as at hibernation or during breeding). For example, water vole may be affected by either periods of drought or episodic heavy rain affecting success during the breeding season³¹. The distribution of species in the uplands may therefore be altered as a result of projected climate change, although the exact nature of the effects are difficult to predict due to the complex nature of interactions between species and their resources.

Future Baseline in the Absence of the Proposed Development

8.129 In the absence of the Proposed Development, the ecological features currently present are likely to persist in their current form. It is anticipated that the Site will continue to be managed as an open-range habitat for grazing sheep, and the habitats along the proposed access route will continue to be used for forestry, sheep and deer. In this event, the constituent habitats and species within the ESA, and their range and distribution, are likely to stay broadly similar to the existing baseline.

Ecological Importance

8.130 Table 8.10 provides an interpretation of the Ecological Importance of the ESA for those habitats and species scoped into the assessment. A detailed account of these habitats is provided in **Appendix 8.2**. As common and widespread habitats have been scoped out, only habitats of conservation interest³ are included in the assessment. For ease of assessment, habitats are grouped by 'conservation interest type', using the highest level of importance (i.e. Annex 1 classification supersedes SBL-listed, and SBL-listed supersedes LBAP status). Note that the habitats and protected listed on the LBAP are all also listed on the SBL and so are not repeated in **Table 8.10** below.

Table 8.10: Ecological Importance Assessment

Ecological Feature	Ecological Importance of Site for Ecological Feature	Rationale
Habitats of Conservation Interest		
Annex 1 Habitats		
H7130 Blanket bogs	County	Phase 1 Habitats: E1.6.1 Blanket bog, E1.7 Wet modified bog NVC Codes: M2, M3, M17, M19, M20 This habitat is extensive and well-connected within the ESA and beyond. Although some areas are modified and affected by grazing, others are moderately species-rich and semi-natural, although no

³⁰ Met Office (2018) UK Climate Projections project (UKCP18).

Ecological Feature	Ecological Importance of Site for Ecological Feature	Rationale
		rare species were recorded. As per guidance ⁸ , habitats in a degraded state should be considered with regards to their <i>potential</i> value. As such, the bog habitats within the ESA either currently or potentially represent a functional example of an Annex 1 habitat, and are therefore a valuable component of the wider resource. The Site is considered to be of County level importance.
H4030 European dry heaths	Local	Phase 1 Habitat: D1 Dry dwarf shrub heath NVC Codes: H10, H12, H21 Dry heath occurs scattered on drier slopes and hilltops in the west of the ESA. It is connected via wet heath and bog habitats and forms part of the overall mosaic of upland habitats with these communities. It is a functional example of an Annex 1 habitat, albeit one that is common in the landscape and which generally occurs on shallow peat deposits. The Site is considered to be of Local level importance.
H4010 Northern Atlantic wet heaths with <i>Erica tetralix</i>	Local	Phase 1 Habitat: D2 Wet dwarf shrub heath NVC Code: M15 Wet heath occurs in mosaic with blanket bog communities in the west of the ESA, on damp, peaty substrate, although generally corresponding to relatively shallower deposits. It is connected to the wider landscape and forms an important part of the overall mosaic of upland habitats. It is a functional example of an Annex 1 habitat, albeit one that is common in the wider landscape. The Site is considered to be of Local level importance.
H7230 Alkaline fens	County	Phase 1 Habitat: E2.2 Basic flush NVC Code: M10 The NVC community that represents this Annex 1 habitat is scattered within the west of the ESA, forming localised flushes often associated with small springs. This habitat has been confirmed to be GWDTE (see Appendix 7.5). The type of habitat is inherently scattered and not extensive, although it forms an important component of the upland habitat mosaic within the ESA. As a functional Annex 1 habitat that is relatively uncommon in the wider landscape, the Site is considered to be of County level importance.
Scottish Biodiversity List Habitats		
Wet Woodland	Study Area	Phase 1 Habitat: A1.1.1 Broadleaved woodland (semi-natural) NVC Code: W4 This is a small and isolated patch of woodland which is affected by the adjacent commercial forestry. It is not considered to be a good, functional example of this habitat type, and so the Site is not considered to be of importance beyond the Study Area level.
Upland Flushes, Fens and Swamps	Local	Phase 1 Habitat: B5 Marshy grassland; E2.2 Basic flush; E2.3 Bryophyte-dominated spring

³¹ National Trust (2019) 2019 wildlife and weather review. Available at: <https://www.nationaltrust.org.uk/features/2019-wildlife-and-weather-review> [Accessed October 2022].

Ecological Feature	Ecological Importance of Site for Ecological Feature	Rationale
		NVC Code: M6, M11, M23, M32 (M10 is considered as Annex 1 above) This habitat type is scattered within the ESA, largely in the west but also with some extents along the proposed access route. In the west, this community forms an important part of the mosaic of upland habitats, and the M32 and M11 communities are notable in largely being confirmed GWDTEs (see Appendix 7.5). Along the existing access track, the habitat is affected (and likely partially created/maintained) by commercial forestry. Overall, the Site is considered to be of Local importance for this habitat.
Upland Heathland	n/a	NVC Codes: H10, H12, H21, M15 Considered in the context of Annex 1 habitats above.
Blanket Bog	n/a	NVC Codes: M2, M3, M17, M19, M20 Considered in the context of Annex 1 habitats above.
Other Habitats		
Scattered broadleaved trees	Study Area	A small number of mature broadleaved trees along the existing track may require to be removed to facilitate the proposed access route. These represent a small proportion of the resource in the wider area, although broadleaved trees and woodland are limited within the ESA. Mature trees have intrinsic value and so the Site is considered to be of Local value for this habitat.
Protected Species		
Bats	Study Area	The ESA does not support known bat roosting sites, and only a small number of trees with potential were recorded. Bat activity across the Site was generally moderate and the assemblage was dominated by common and widespread pipistrelle species. From the desk study assessments it is considered that there is more suitable foraging habitat within the wider landscape, and in the absence of extensive evidence of bat roosts within the BSA, it is likely that the Site is not of importance for bats beyond the Study Area level.
Otter	Study Area	Evidence of otter was predominantly found on or near the Eas an Amair in the west of the ESA. However this was only in the form of prints and spraints, and no resting up sites were recorded. The spraints were of varying ages. In addition, a single old spraint was noted a substantial distance away on the Steallaire Bàn Loch in the east of the ESA. It is considered likely that the ESA forms part of two larger territories, one of which encompasses the Eas an Amair and nearby waterbodies in the west of the ESA, with the core of this territory being further west on Loch Awe. A second territory encompasses habitats in the east, including the Steallaire Bàn Loch, with the core of the territory being outwith the ESA on Loch Fyne. As the ESA is located between two large lochs, it is considered that more suitable habitat is present in the wider landscape, and in the

Ecological Feature	Ecological Importance of Site for Ecological Feature	Rationale
		absence of extensive evidence of otter within the ESA, it is likely that the Site is not of importance for otter beyond the Study Area level.
Red squirrel	Study Area	Red squirrel were sighted and confirmed to be present in the east of the ESA. Given the lack of other field signs and the known preference of the species for more diverse conifer woodlands than the predominant Sitka spruce monoculture in the east of the ESA, and the lack of suitable habitat in the west of the ESA, it is considered reasonable to infer that red squirrel density is low within the east and absent from the west of the ESA. Furthermore, from the desk study assessments, it is considered that there is more suitable habitat within the wider landscape, and in the absence of extensive evidence of red squirrel within the ESA it is likely that the Site is not of importance for red squirrel beyond the Study Area level.
Pine marten	Study Area	Pine marten scats identified near the edge of the conifer forestry have confirmed the presence of this species in the ESA, and a sighting of a pine marten confirms it to be present in the wider area. Although habitats in the west of the ESA lack woodland cover, pine marten occupy large home ranges and utilise a range of non-wooded habitats ³² , therefore the ESA is likely to be part of a larger territory. However, from desk study assessments it is considered that there is more suitable habitat within the wider landscape, and in the absence of extensive evidence of pine marten within the ESA (considered to be partially due to the preference of pine marten for diverse conifer woodlands rather than the predominant monoculture of Sitka Spruce of similar ages within the ESA), it is likely that the Site is not of importance for pine marten beyond the Study Area level.
Water vole	County	Evidence of water vole was recorded along watercourses in the west of the ESA, and several areas of optimal habitat were identified. Water voles in the uplands occur as metapopulations ³³ , with local extinctions and colonisations occurring in response to stochastic (chance) events. As such, it is considered likely that water vole may occur in any area of suitable habitat adjacent to slow-moving water within the ESA. It is considered from desk study assessment that there is additional suitable habitat within the wider landscape. However, the water vole population has experienced a drastic decline due to habitat changes and predation pressure, and upland areas and headwater streams are now the most important remaining sites for water vole in some areas ³⁴ . As such, given the confirmed presence of water vole within the ESA, the Site is considered to be of County level importance.

Identification of Likely Effects

8.131 Potential effects associated with the construction and operation of the Proposed Development have been identified through consideration of information provided in **Chapter 4**, standard guidance and guidelines and the professional judgment of the author.

³² Birks, J.D.S. (2002). The Pine Marten. The Mammal Society, London.

³³ Capreolus Wildlife Consultancy (2005). The ecology and conservation of water voles in upland habitats. Scottish Natural Heritage Commissioned Report No. 099 (ROAME No. F99AC320).

³⁴ Mathews, F., Kubasiewicz, L.M., Gurnell, J., Harrower, C.A., McDonald, R.A., & Shore, R.F. (2018). A Review of the Population and Conservation Status of British Mammals. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough.

8.132 Table 8.11 relates ecological features to potential effects, effect pathways and development activities. For ease of reference, the table is set out by ecological feature. Note that potential effects on GWDTEs are considered in **Chapter 7**. The significance of each potential effect is then assessed in following sections. The significance of each potential effect is then assessed in the following sections.

Table 8.11: Identification of Likely Effects

Ecological Feature	Development Activity	Likely Effect Pathway	Likely Effect
Construction Activities			
Habitats	<ul style="list-style-type: none"> Surface vegetation clearance. Excavation for construction of turbine platforms and infrastructure. Construction of turbine platforms and infrastructure. Presence and use of fuelled plant. 	<ul style="list-style-type: none"> Physical removal of habitat. Changes in water quality and volume. Change in hydrological regime of peatland habitats. Pollution event. 	Direct habitat loss
			Habitat fragmentation
Bats	<ul style="list-style-type: none"> Surface vegetation clearance during access track upgrade/construction. Installation of construction site security lighting. Presence of construction staff and vehicles. 	<ul style="list-style-type: none"> Removal of woodland vegetation (sheltering and foraging habitat). Light spill on retained vegetation (sheltering and foraging sites). Accidental disturbance from site staff and plant. 	Direct habitat loss
			Habitat fragmentation
			Mortality
			Disturbance
Otter	<ul style="list-style-type: none"> Excavation for construction of turbine platforms and infrastructure. Construction of watercourse crossings. Use of cementitious materials for turbine platforms. Presence and use of fuelled plant. Presence of construction staff and vehicles. 	<ul style="list-style-type: none"> Changes in water quality and volume. Change in hydrological regime of peatland habitats. Loss of riparian habitat used for sheltering, commuting and foraging. Pollution event. Trapped in site excavations. Road collision with site vehicles. Accidental disturbance from site staff and plant. 	Direct habitat loss
			Habitat fragmentation
			Mortality
			Disturbance
Badger	<ul style="list-style-type: none"> Surface vegetation clearance during access track upgrade/construction. Excavation for construction of turbine platforms and infrastructure. Installation of construction site security lighting. Presence of construction staff and vehicles. 	<ul style="list-style-type: none"> Loss of potential habitat used for sheltering, commuting and foraging. Trapped in site excavations. Light spill on retained vegetation (sheltering and foraging sites). Road collision with site vehicles. Accidental disturbance from site staff and plant. 	Direct habitat loss
			Mortality
			Disturbance
Red squirrel	<ul style="list-style-type: none"> Surface vegetation clearance during access track upgrade/construction. 	<ul style="list-style-type: none"> Removal of woodland vegetation (sheltering and foraging habitat). Road collision with site vehicles. 	Direct habitat loss
			Habitat fragmentation

Ecological Feature	Development Activity	Likely Effect Pathway	Likely Effect
	<ul style="list-style-type: none"> Presence of construction staff and vehicles. 	<ul style="list-style-type: none"> Accidental disturbance from site staff and plant. 	Mortality
			Disturbance
Pine marten	<ul style="list-style-type: none"> Surface vegetation clearance during access track upgrade/construction. Installation of construction site security lighting. Presence of construction staff and vehicles. 	<ul style="list-style-type: none"> Loss of potential habitat used for sheltering, commuting and foraging. Trapped in site excavations. Light spill on retained vegetation (sheltering and foraging sites). Road collision with site vehicles. Accidental disturbance from site staff and plant. 	Direct habitat loss
			Habitat fragmentation
			Mortality
			Disturbance
Water vole	<ul style="list-style-type: none"> Excavation for construction of turbine platforms and infrastructure. Construction of watercourse crossings. Use of cementitious materials for turbine platforms. Presence and use of fuelled plant. Presence of construction staff and vehicles. 	<ul style="list-style-type: none"> Changes in water quality and volume. Change in hydrological regime of peatland habitats. Loss of riparian habitat used for sheltering, dispersal and foraging. Pollution event. Trapped in site excavations. Road collision with site vehicles. Accidental disturbance from site staff and plant. 	Direct habitat loss
			Habitat fragmentation
			Mortality
			Disturbance
Operational Activities			
Bats	<ul style="list-style-type: none"> Operation of turbines at night (taken to be 30 minutes prior to sunset until 30 minutes after sunrise). 	<ul style="list-style-type: none"> Changes in air pressure around operational turbines and along commuting and foraging corridors. Accidental collision with turbine blades. 	Habitat fragmentation
			Mortality

Design Considerations

8.133 The assessment recognises that environmental considerations were taken into account during the design process. Relevant considerations include:

- Location of infrastructure on non-peat or shallower peat habitats, and less sensitive blanket bog where possible (while recognising that much of the Site comprises blanket bog).
- Inclusion of a 50m buffer between watercourses/waterbodies and turbine locations, with the exception of a limited number of locations for which a smaller buffer has been observed (see **Chapter 7**).
- Minimisation of the number of watercourse crossings.
- Observation of 50m blade clearance from areas of woodland habitats that provide commuting and foraging habitat for bats.
- Minimising of vegetation removal to accommodate access track by using existing tracks and firebreaks where possible.
- Design of watercourse crossings to minimise risk to fish populations and habitat, including:
 - Use of bottomless arch or single span crossings wherever possible in the first instances;

- Retention/recreation of natural stream beds wherever possible;
- Closed pipes used as a last resort; and
- Commitment to set any pipe culverts below the existing watercourse bed wherever possible and to make use of natural bed material.

Micrositing

8.134 Any micrositing of infrastructure will be based on a review of existing ecological data and the completion of pre-construction surveys, to take into consideration the potential for direct encroachment onto protected species features, sensitive habitats or indirect alteration of hydrological flows supporting sensitive habitats.

8.135 Any micrositing will also take consideration of any buffer distances on protected features identified, as detailed within the SPP that will be finalised following further pre-construction surveys. With these micrositing precautions and procedures in place, should micrositing be utilised, then the significance of effect on ecological receptors will not be greater than those predicted within this chapter.

Good Practice Measures

8.136 In addition to the wind farm design considerations detailed above, standard good practice measures will be implemented during construction and operation of the Proposed Development. Standard and embedded good practice measures are detailed in **Chapter 4** and **Appendix 4.3**. These good practice and embedded mitigation measures are included in the assessment of otherwise unmitigated effects on important ecological features below.

Construction Environment Management Plan

8.137 At this stage, a CEMP has been prepared in outline (see **Appendix 4.2**). However, it is proposed that a full CEMP be produced in compliance with the requirements of a condition on any planning permission granted for the Proposed Development, in discussion with statutory stakeholders, prior to the commencement of construction activity. The following will be key features of the CEMP, as detailed in **Appendix 4.2**.

- An Advisory Ecological/Environmental Clerk of Works (ECoW) will be appointed to advise on the content of the CEMP and its delivery. The ECoW will also be present during construction and will also monitor compliance with the CEMP and relevant legislation. The ECoW will regularly provide reports on a weekly basis which will be made available to all relevant site staff including the developer. A detailed Scope of Works for the role will be agreed with NatureScot before construction commences. The definition and scope of the role of ECoW has been defined within **Appendix 4.2**.
- Best practice will be followed in relation to pollution prevention. In particular, all Guidance for Pollution Prevention (GPPs)³⁵ will be adhered to in detailed design and construction.
- All watercourse crossings will be designed and constructed in line with current best practice and in accordance with a Construction Site Licence (from SEPA) that will be necessary before works commence.
- Mature native trees will be retained wherever possible, and suitable tree protection measures will be implemented as necessary in accordance with BS5837:2012 'Trees in Relation to Design, Demolition and Construction – Recommendations'.
- Where possible, surface vegetation will be stripped and stored according to best practice methods, and used in restoration of track verges and turbine beds, etc.
- The CEMP will include and be supported by the OREP provided in **Appendix 8.5** which sets out initial proposals for the restoration of habitats and the overall improvement of the Site's biodiversity. An Outline Peat Management Plan (OPMP) has also been produced and is provided in **Appendix 7.3**.
- The CEMP will include and be supported by a Species Protection Plan (SPP) which will set out the approach to the monitoring of protected species during construction. This will include a programme of re-survey to ensure mobile species are protected during works. The SPP will also detail proposals for longer-term monitoring, particularly in relation to bats and water vole. The

level of survey effort and the scope of SPP will be proportionate and cognisant of the limited evidence of protected species identified.

- Regular ecological survey updates will be undertaken, to ensure survey data being relied upon during construction is not more than 12 months old as per best practice guidelines⁸, in the season immediately prior to construction (particularly for mobile species, including bats, otter and badger). Where surveys find evidence of new protected features (e.g. resting sites), micrositing will attempt to avoid effects. If this is not possible, the ECoW will make the necessary protected species licence applications.
- Excavations and trenches will be fenced, covered or a means of escape provided when left unattended to prevent animals falling in and becoming trapped.

8.138 Temporary open pipe systems will be capped when unattended to prevent animals accessing them and becoming trapped.

Species Protection Plans

8.139 Measures will be implemented to ensure legislative compliance during construction with regards to protected species. These measures will be captured in the CEMP and Species Protection Plan (SPP). SPPs for the protected species and notable species considered in this assessment will be drawn up and implemented to monitor species during construction and operation. They will include pre-construction survey updates and detail any species-specific mitigation measures required. They will be 'live' documents that will be updated in light of new findings.

8.140 The SPPs will include, but not be limited to, the following measures:

- Pre-construction update surveys will confirm the current status of the Site with regards to the protected and notable species that have been confirmed to be present within the Site.
- Security lighting will be designed to minimise light-spill on sensitive habitat features such as watercourses, waterbodies, and woodland edges.
- Pre-construction fish habitat surveys will be undertaken at watercourse crossings to provide the habitat baseline within a buffer of up to 100m upstream and downstream and to allow micrositing of the crossings away from potentially sensitive habitats wherever possible.
- Pre-construction surveys of proposed infrastructure routes within forested areas no more than six months prior to construction.
- Micrositing of the infrastructure will avoid any notable features identified (e.g. sett/drey/den) during pre-construction surveys in forested areas. If unavoidable, the ECoW will make necessary protected species licence applications.
- The ECoW will be consulted during micrositing and construction of watercourse crossings to ensure protection of the water environment and sensitive ecological features (including otter, water vole and fish habitat), and to ensure implementation of the design principles.
- Post-construction fish habitat surveys and monitoring will be undertaken to ensure that mitigation measures are effective, that crossings maintain fish passage, and that potentially sensitive habitats are retained, and to identify any requirement for improvements or remedial works.

Assessment of Effects

8.141 The assessment of effects is based on the project description as outlined in **Chapter 4**. Unless otherwise stated, potential effects identified are considered to be negative.

Predicted Construction Effects

8.142 In this section, drawing on **Table 8.11**, an assessment is made of the significance of likely effects on ecological features during construction, in the absence of mitigation. Unless highlighted as otherwise, all likely effects are considered to be adverse.

³⁵ NetRegs (2021) Guidance for Pollution Prevention (GPP) documents. Available at: <https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/> [Accessed October 2022]

8.143 The application for consent includes a request for up to a 50m micro-siting tolerance for site infrastructure where ground investigation works and/or geotechnical surveys find ground conditions to be unsuitable for construction. In the event that micro-siting is required, habitat and protected species surveys of the 'new' location will be required before works can begin. Micro-siting should maintain the 50m buffer between infrastructure locations and all watercourses, wherever possible. In areas where it has not been possible to achieve the 50m buffer between infrastructure and watercourses (see **Appendix 7.1**), there will be no further encroachment into these buffers.

Habitats

8.144 Potential effects on habitats have been identified as direct habitat loss (in relation to the removal of habitat to construct turbines and associated infrastructure, and through changes to hydrological regimes as a consequence of construction) and habitat fragmentation (in relation to changes in hydrological regimes).

8.145 In relation to direct habitat loss, approximately 37ha is forecast to be lost, of which approximately 9ha encompasses the existing track and quarries, and limited extents of habitats either side. As such, approximately 28ha would be lost from the open range. **Table 8.12** details the total area to be lost, of each habitat type of conservation interest (as defined in **Table 8.10** above), arising from the Site infrastructure.

Table 8.12: Habitat Loss Calculations³⁶

Phase 1 Habitat	NVC Codes	Area to be Lost (ha)	Total of Habitat Type Within ESA (ha)	% of ESA Habitat Resource to be Lost
B5 Marshy grassland	M23 only	0.7	32.6	2.2
D1 Dry dwarf shrub heath D5 Dry heath/acid grassland mosaic	H10, H12, H21	1.0	35.2	2.7
D2 Wet dwarf shrub heath D6 Wet heath/acid grassland mosaic	M15	1.5	69.6	2.1
E1.6.1 Blanket bog E1.7 Wet modified bog	M2, M3, M4, M17, M19, M20, M25	21.2	665.6	3.2
Total		24.4	802.9	3.0

8.146 In addition to the habitats listed in **Table 8.12** above, a small number of mature broadleaved trees along the existing access track may require removal. It is not possible at this stage to be sure of the exact number of trees; however, the area of proposed felling is reported in **Appendix 4.1: Forestry** to be 3.77ha, of which 0.96ha comprises broadleaved trees. As discussed previously in relation to ancient woodland (see **Designated Sites**), approximately 0.2ha of these broadleaved trees were assessed to have been planted pre-1900, although only six were noted to exhibit features indicative of veteran status²³, and only two of these are located within the felling parcels.

8.147 **Table 8.12** above highlights the limited nature of habitat loss within the ESA. Notably, in all cases, less than 4% of the ESA's resource of each habitat of conservation interest will be lost to development.

8.148 There is no loss of the following communities that represent habitats of conservation concern:

- M10, M11 (Annex 1 Alkaline fens).
- M6 and M32 (SBL Upland Flushes, Fens and Swamps).

- W4 (SBL Wet Woodland).

8.149 Based on the small areas of habitat loss, no significant effects are predicted for the following habitat types:

- Annex 1 Northern Atlantic wet heaths with *Erica tetralix*.
- Annex 1 European dry heaths.
- SBL Upland Flushes, Fens and Swamps.

8.150 The most notable losses of habitats of conservation interest relate to bog habitats (approximately 3.2% loss). However, the proportion of these habitats to be lost in comparison to the available resource within the ESA is limited and the losses are not considered to adversely affect the integrity of these habitats in a wider context.

8.151 Habitat fragmentation, particularly of peat-forming habitats, largely relate to changes in the hydrological regime of the Site during and following construction. The effect on the hydrological regime of habitats is assessed in **Chapter 7**.

8.152 In considering the above, the significance of potential effects on habitats is detailed in **Table 8.13**. Significance is assessed within the context of the Ecological Importance of the ESA for these habitats (see **Table 8.10**).

Table 8.13: Assessment of Significance of Likely Construction Effects - Habitats

Parameter	Likely Effect	
	Direct Habitat Loss	Habitat Fragmentation
Extent	Habitat loss is limited to a small proportion of the habitats of conservation interest within the ESA. However, of note is the loss of bog habitats (Annex 1 habitat).	Habitat fragmentation, through the construction of new access tracks, will largely occur on the open ground in the west of the ESA. However, the habitats here are heavily influenced by topography and surface water. The network of watercourses and lochans will be maintained, and in addition, bog habitats are ombrogenous (rain-fed).
Magnitude	Proposed habitat loss is extremely unlikely to have an effect on the survivability of the habitats of conservation interest within the ESA.	A commitment to utilise the existing access track within the east of the Site means that habitat fragmentation is limited. Habitats of conservation interest within the ESA will retain their structure and viability.
Duration	Permanent	Permanent
Frequency	One-off event during construction.	One-off event during construction.
Reversibility	Irreversible	Reversible
Likelihood	Certain	Certain
Significance (EclA)	Significant (at Study Area level) for bog habitats only	Not significant
Significance (EIA)	Minor significance	Not significant

Protected Species

Bats

8.153 Likely effects on bats during construction have been identified as:

- Direct habitat loss in relation to suitable sheltering, commuting and foraging habitat.

³⁶ Where the habitat is a heath/acid grassland mosaic, half of any habitat loss is assigned to each of the component habitat types.

- Habitat fragmentation through severance of commuting and foraging corridors.
- Mortality as a consequence of direct contact, e.g. during vegetation removal.
- Disturbance through an increased human and vehicle presence, resulting in increased noise and vibration.

8.154 Potential construction effects are associated with the proposed access route only.

8.155 The design process has considered these likely effects and sought to minimise them. Vegetation removal has been minimised as far as possible by utilising existing infrastructure and forest firebreaks.

8.156 In considering the above, the significance of potential effects on bats is detailed in **Table 8.14**. Significance is assessed within the context of the Ecological Importance of the BSA for bats (see **Table 8.10**).

Table 8.14: Assessment of Significance of Likely Construction Effects - Bats

Parameter	Likely Effect			
	Direct Habitat Loss	Habitat Fragmentation	Mortality	Disturbance
Extent	Limited to individual trees to be removed to facilitate the proposed access route. Up to six trees known to have from Moderate to High potential may require to be felled or limbed along the existing access track.	There are no proposed areas of clearfell. The existing track and firebreaks will be used where possible, with the exception of a short sections through immature forestry and a short section near the Steallaire Bàn Loch. Otherwise only narrow strips will be removed from the existing forest edge.	Limited to individual trees where bats may roost, along the existing access track.	Limited to individual trees where bats may roost, along the existing access track.
Magnitude	A small proportion of the available resource of the ESA could be affected.	A small proportion of the available resource of the ESA could be affected.	Limited to a small number of potential tree roosts. While roosts may be lost, it is likely that other roosts exist in suitable structures and trees in the wider area.	A small proportion of the available resource of the ESA could be affected.
Duration	Project lifetime	Project lifetime	18-month construction phase, but permanent to the individual(s) killed.	Intermittent during 18-month construction phase.
Frequency	One-off event during construction.	One-off event during construction.	One-off event during construction.	Intermittent during construction.
Reversibility	Irreversible	Irreversible	Irreversible at the level of the individual animal; reversible at the population level.	Reversible
Likelihood	Unlikely on the basis of the small number of trees noted to have bat roost potential.	Extremely unlikely	Unlikely on the basis of the small number of trees noted to have bat roost potential.	Extremely unlikely
Significance (EclA)	Significant (at Study Area level)	Not significant	Significant (at Study Area level)	Not significant

Parameter	Likely Effect			
	Direct Habitat Loss	Habitat Fragmentation	Mortality	Disturbance
Significance (EIA)	Minor significance	Not significant	Minor significance	Not significant

Otter

8.157 Likely effects on otter during construction have been identified as:

- Direct habitat loss in relation to suitable sheltering, commuting and foraging habitat.
- Habitat fragmentation through severance of commuting and foraging corridors.
- Mortality as a consequence of direct contact or pollution event.
- Disturbance through an increased human and vehicle presence, resulting in increased noise and vibration.

8.158 No resting up sites were identified within the ESA. However, evidence of otter was noted concentrated in the west of the ESA where spraints and prints were recorded on watercourses, particularly the Eas an Amair and associated tributaries and lochans. An old spraint was also noted at the Steallaire Bàn Loch in the east. The watercourses and waterbodies within the ESA are considered to provide high suitability foraging and commuting habitat for otter, although limited opportunities for resting sites, and no resting sites have been identified within the ESA.

8.159 The design process has considered the potential effects on otter, and their known distribution within the ESA. With exception of the watercourse crossings and limited incursions in a small number of areas identified (see **Chapter 7**), no construction works will take place within 50m of a watercourse/waterbody. Strict pollution prevention measures will be implemented.

8.160 Due to a range of constraints, there are limited incursions into the 50m watercourse buffer (see **Chapter 7**). However, most of these are small, ephemeral watercourses which are unlikely to be used by otter on a regular basis (for example near T4), therefore works are not considered likely to adversely affect otters at these locations. One location noted does have more notable potential for occasional use by otter, specifically on the track between T5 and T6 (20m from Loch nan Carr); however, no resting sites were noted, and with suitable mitigation in place as per the SPP, including the use of an ECoW and commitment to follow GPPs, the works are unlikely to adversely affect otter.

8.161 Blasting will avoid conflict with the crepuscular nature of otters by avoiding scheduling blasting between 30 minutes after sunrise and 30 minutes before sunset, thereby reducing the risk of mortality and disturbance.

8.162 In considering the above, the significance of potential effects on otter is detailed in **Table 8.15**. Significance is assessed within the context of the Ecological Importance of the ESA for otter (see **Table 8.10**).

Table 8.15: Assessment of Significance of Likely Construction Effects – Otter

Parameter	Likely Effect			
	Direct Habitat Loss	Habitat Fragmentation	Mortality	Disturbance
Extent	Limited to 74 new watercourse crossings.	Limited to 74 new watercourse crossings.	Localised to the area around 74 new watercourse crossings.	Localised to the area around 74 new watercourse crossings.
Magnitude	Limited to relatively small areas within wider riparian habitat.	Limited to relatively small area of wider suitable riparian habitat but has the potential to disrupt commuting patterns and access to territories.	Limited to a very small number of otters, based on the lack of resting sites identified during surveys.	Limited to isolated construction events.

Parameter	Likely Effect			
	Direct Habitat Loss	Habitat Fragmentation	Mortality	Disturbance
Duration	Project lifetime.	Project lifetime.	18-month construction phase, but permanent to the individual(s) killed.	Intermittent during 18-month construction phase.
Frequency	One-off event at each watercourse crossing during the construction phase.	One-off event at each watercourse crossing during the construction phase.	Potentially repeated during construction phase.	Potentially repeated during construction phase.
Reversibility	Irreversible	Irreversible	Irreversible at the level of the individual animal; reversible at the population level.	Reversible
Likelihood	Certain	Certain	Extremely unlikely	Unlikely
Significance (EcIA)	Not significant	Not significant	Not significant	Not significant
Significance (EIA)	Not significant	Not significant	Not significant	Not significant

Badger

8.163 Likely effects on badger during construction have been identified as:

- Direct habitat loss in relation to suitable sheltering and foraging habitat in woodland in the east of the ESA.
- Mortality as a consequence of direct contact, e.g. road collision.
- Disturbance through an increased human and vehicle presence, resulting in increased noise and vibration.

8.164 No evidence of badger has been recorded during field surveys; the ESA is dominated by coniferous forest, heath and bog, habitats that are not considered optimal³⁷. However, due to the difficulty in surveying some areas of dense plantation, and given the knowledge that badgers do occur in upland habitats albeit at low densities³⁷, the presence of badger at low density in the ESA cannot be ruled out.

8.165 The design process has considered the potential effects on badger, and the proposed access route follows an existing track where possible, thereby reducing vegetation removal. The assessment below also considers the difficulty of identifying red squirrel field signs. Furthermore, embedded mitigation includes production of SPPs as part of the CEMP, pre-construction surveys, and engagement of an ECoW

8.166 In considering the above, the significance of potential effects on badger is detailed in **Table 8.16**. Significance is assessed within the context of the Ecological Importance of the ESA for badger (see **Table 8.10**).

Table 8.16: Assessment of Significance of Likely Construction Effects – Badger

Parameter	Likely Effect		
	Direct Habitat Loss	Mortality	Disturbance
Extent	Localised along the proposed access route in the east of the ESA.	Localised along the proposed access route in the east of the ESA	Localised along the proposed access route in the east of the ESA.

³⁷ Rainey, E., Butler, A., Bierman, S. and Roberts, A.M.I. (2009). Scottish Badger Distribution Survey 2006 – 2009: estimating the distribution and density of badger main setts in Scotland. Report prepared by Scottish Badgers and Biomathematics and Statistics Scotland.

Parameter	Likely Effect		
	Direct Habitat Loss	Mortality	Disturbance
		and at construction areas across the Site.	
Magnitude	Limited to small areas of generally low suitability habitat.	Very low as, if present, this species is likely to be at a low density.	Low as this species is likely to be present at a low density in the east of the ESA.
Duration	Project lifetime	18-month construction phase, but permanent to the individual(s) killed.	Intermittent during 18-month construction phase.
Frequency	One-off event during construction.	Potentially repeated during construction phase.	Intermittent during construction.
Reversibility	Irreversible	Irreversible at the level of the individual animal; reversible at the population level.	Reversible
Likelihood	Certain	Extremely unlikely	Unlikely
Significance (EcIA)	Not significant	Not significant	Not significant
Significance (EIA)	Not significant	Not significant	Not significant

Red Squirrel

8.167 Likely effects on red squirrel during construction have been identified as:

- Direct habitat loss in relation to suitable sheltering, dispersal and foraging habitat in woodland in the east of the ESA.
- Habitat fragmentation through severance of commuting and foraging corridors.
- Mortality as a consequence of direct contact, e.g. road collision.
- Disturbance through an increased human and vehicle presence, resulting in increased noise and vibration.

8.168 Red squirrel was observed within woodland in the east of the ESA; habitats in the west are not suitable. No further field signs were recorded and no dreys were seen. The woodland habitats within the ESA are not optimal for this species as it largely comprises a monoculture of commercial forestry. However, animals are present along the proposed access route, albeit they are likely to be at low density.

8.169 The design process has considered the potential effects on red squirrel; tree removal to facilitate the proposed access route is limited and requires no clear-felling. The assessment below also considers the difficulty of identifying red squirrel field signs. Furthermore, embedded mitigation includes production of SPPs as part of the CEMP, pre-construction surveys, and engagement of an ECoW.

8.170 In considering the above, the significance of potential effects on red squirrel is detailed in **Table 8.17**. Significance is assessed within the context of the Ecological Importance of the ESA for red squirrel (see **Table 8.10**).

Table 8.17: Assessment of Significance of Likely Construction Effects – Red Squirrel

Parameter	Likely Effect			
	Direct Habitat Loss	Habitat Fragmentation	Mortality	Disturbance
Extent	Localised along the proposed access route in the east of the ESA.	Localised along the proposed access route in the east of the ESA.	Localised along the proposed access route in the east of the ESA.	Localised along the proposed access route in the east of the ESA.
Magnitude	Limited to small areas of generally low suitability habitat.	Very low. Where possible, the existing access track will be used to minimise the potential for fragmentation.	Very low as this species is likely to be present at a low density in the east of the ESA.	Low as this species is likely to be present at a low density in the east of the ESA.
Duration	Project lifetime	Project lifetime	18-month construction phase, but permanent to the individual(s) killed.	Intermittent during 18-month construction phase.
Frequency	One-off event during construction.	One-off event during construction.	Potentially repeated during construction phase.	Intermittent during construction.
Reversibility	Irreversible	Irreversible	Irreversible at the level of the individual animal; reversible at the population level.	Reversible
Likelihood	Certain	Extremely unlikely	Extremely unlikely	Unlikely
Significance (EclA)	Not significant	Not significant	Not significant	Not significant
Significance (EIA)	Not significant	Not significant	Not significant	Not significant

Pine Marten

8.171 Likely effects on pine marten during construction have been identified as:

- Direct habitat loss in relation to suitable sheltering and foraging habitat in woodland in the east of the ESA.
- Habitat fragmentation through severance of commuting and foraging corridors.
- Mortality as a consequence of direct contact, e.g. road collision.
- Disturbance through an increased human and vehicle presence, resulting in increased noise and vibration.

8.172 No dens were identified during the surveys; however habitats within the ESA offered limited suitability to pine marten due to the monoculture forestry in the east of the Site, the general age of the trees (largely semi-mature and lacking cavities for denning), and wet conditions.

8.173 Two scats were found on the existing track in the east of the ESA, and in the wider area an individual animal was seen. Forestry habitats are extensive in the surrounding area, although not all forestry in the ESA could be accessed during surveys due to the density of the plantations. However, given the confirmation of the presence of this species, and the fact that it is known to utilise a range of habitat types over large home ranges, pine marten is assumed to use the ESA although likely not as a core territory holding.

8.174 The design process has considered the potential effects on pine marten; tree removal to facilitate the proposed access route is limited and requires no clear-felling. The assessment below also considers the difficulty of surveying the conifer forestry, and of identifying pine marten field signs and dens. Furthermore, embedded mitigation includes production of SPPs as part of the CEMP, pre-construction surveys, and engagement of an ECoW.

8.175 In considering the above, the significance of potential effects on pine marten is detailed in **Table 8.18**. Significance is assessed within the context of the Ecological Importance of the ESA for pine marten (see **Table 8.10**).

Table 8.18: Assessment of Significance of Likely Construction Effects – Pine Marten

Parameter	Likely Effect			
	Direct Habitat Loss	Habitat Fragmentation	Mortality	Disturbance
Extent	Localised along the proposed access route in the east of the ESA.	Localised along the proposed access route in the east of the ESA.	Localised along the proposed access route in the east of the ESA.	Localised along the proposed access route in the east of the ESA.
Magnitude	Limited to small areas of generally low suitability habitat.	Very low. Where possible, the existing access track will be used to minimise the potential for fragmentation.	Very low as this species is likely to be present at a very low density in the east of the ESA.	Very low as this species is likely to be present at a very low density in the east of the ESA.
Duration	Project lifetime	Project lifetime	18-month construction phase, but permanent to the individual(s) killed.	Intermittent during 18-month construction phase.
Frequency	One-off event during construction.	One-off event during construction.	Potentially repeated during construction phase.	Intermittent during construction.
Reversibility	Irreversible	Irreversible	Irreversible at the level of the individual animal; reversible at the population level.	Reversible
Likelihood	Certain	Extremely unlikely	Extremely unlikely	Extremely unlikely
Significance (EclA)	Not significant	Not significant	Not significant	Not significant
Significance (EIA)	Not significant	Not significant	Not significant	Not significant

Water Vole

8.176 Likely effects on water vole during construction have been identified as:

- Direct habitat loss in relation to suitable sheltering and foraging habitat.
- Habitat fragmentation through severance of dispersal and foraging corridors.
- Mortality as a consequence of direct contact or pollution event.
- Disturbance through an increased human and vehicle presence, resulting in increased noise and vibration.

8.177 Evidence of water vole has been found in the west of the ESA. This included burrows, runs, feeding signs and a latrine, with signs recorded on the Eas an Amair, on a tributary of the Allt Blarghour, and on the Alltan Airigh Mhic Choinnich. As water vole in the uplands exists in a metapopulation of colonies³³, it is possible that water vole could utilise any area of suitable habitat beside slow-moving water within the ESA.

8.178 The design process has considered the potential effects on water vole and sought to minimise them. With exception of the watercourse crossings and limited incursions in a small number of areas identified (see **Chapter 7**), no construction works will take place within 50m of a watercourse. Strict pollution prevention measures will be implemented.

8.179 Due to a range of constraints, there are limited incursions into the 50m watercourse buffer which is therefore reduced to a minimum of 30m from watercourses in a small number of specific locations (see **Chapter 7**). However, most of these are small, ephemeral watercourses, and none of them have been noted to have water vole signs or significant potential habitat.

8.180 With suitable mitigation in place – including suitable design and micrositing of watercourse crossings as laid out in relation to protection of the aquatic environment, a comprehensive SPP, the presence of an ECoW, and commitment to implement strict pollution prevention measures (see **Design Considerations, Micrositing and Good Practice Measures**) - the works are unlikely to adversely affect water vole habitat.

8.181 The provision of an ECoW and pre-works surveys will reduce the risk of mortality and disturbance.

8.182 In considering the above, the significance of potential effects on water vole is detailed in **Table 8.19**. Significance is assessed within the context of the Ecological Importance of the ESA for water vole (see **Table 8.10**).

Table 8.19: Assessment of Significance of Likely Construction Effects – Water Vole

Parameter	Likely Effect			
	Direct Habitat Loss	Habitat Fragmentation	Mortality	Disturbance
Extent	Limited to 74 new watercourse crossings.	Limited to 74 new watercourse crossings.	Localised to the area around 74 new watercourse crossings.	Localised to the area around 74 new watercourse crossings.
Magnitude	Limited to relatively small areas within wider riparian habitat. Scheme design has avoided known populations.	Limited to watercourse crossings which may become impassable. County importance of this population suggests that any obstruction to dispersal and genetic viability is important.	Very low as scheme design has avoided current known populations.	Limited to localised sub-populations of the wider Site resource.
Duration	Permanent	Permanent	Temporary at the population level, but permanent to the individual(s) killed.	Intermittent during 18-month construction phase.
Frequency	One-off event during construction.	One-off event during construction.	Potentially repeated during construction phase.	Intermittent during construction.
Reversibility	Irreversible	Irreversible	Irreversible at the level of the individual animal; reversible at the population level.	Reversible
Likelihood	Certain	Likely	Unlikely	Extremely unlikely
Significance (EclA)	Not significant	Significant (at Local level)	Significant (at Study Area level)	Not significant
Significance (EIA)	Not significant	Minor significance	Minor significance	Not significant

Proposed Mitigation

8.183 Significant effects (in EclA terms) at the Study Area level have been identified. In EIA terms, these are considered to be Minor and not significant. As such, no additional mitigation measures are required. However, specific mitigation measures are set out in **Table 8.20**.

Table 8.20: Proposed Mitigation – Construction Phase

Ecological Feature	Effect	Specific Mitigation
Habitats	Direct Habitat Loss	Implementation of the OREP and OPMP as a means of minimising effects on peatland habitats, and identifying areas of peatland in poor condition where restoration will improve the wider site resource. This will include: <ul style="list-style-type: none"> ■ Extensive restoration of areas of damaged and eroded peat within the Site, including reprofiling and infill (approximately 133ha). ■ Blocking of drains thereby safeguarding and improving approximately 310ha of peatland.
Bats	Direct Habitat Loss	Trees with bat roost potential will be retained and protected where possible. All trees to be felled or limbed (or which could be disturbed by increased site activity) will be surveyed for bat activity immediately prior to construction (i.e. within season immediately prior). If bat roosts identified, licensing process will be followed, which will include the provision of alternative roosting features in adjacent trees.
	Mortality	
Water Vole	Habitat Fragmentation	Pre-construction surveys of all water-crossings (i.e. within survey season for water vole immediately prior). Micrositing will avoid any new burrows identified during update surveys. If unavoidable, ECoW will make necessary protected species licence applications. All watercourse crossings will be mammal friendly, with banksides retained or mammal ledges installed. Water vole monitoring as part of the OREP.
	Mortality	

Residual Construction Effects

8.184 Subject to adherence with all embedded and species-specific mitigation, no significant residual construction effects have been identified as all construction effects are determined to be not significant in the context of the EIA Regulations (**Table 8.4**).

Predicted Operational Effects

8.185 In this section, drawing on **Table 8.11**, an assessment is made of the significance of likely effects on ecological features during operation of the Proposed Development, in the absence of mitigation. Unless highlighted as otherwise, all likely effects are considered to be adverse.

Protected Species

8.186 Operational effects have been scoped out for all species other than bats.

Bats

8.187 Potential effects on bats have been identified as:

- Habitat fragmentation in relation to lost commuting lines and foraging habitat due to the presence of turbines.
- Mortality in relation to barotrauma caused by changes in air pressure around turbines, and direct collision.

8.188 It is widely acknowledged that common and widespread bat species (such as common and soprano pipistrelle, which accounted for the vast majority of bats recorded) favour linear features such as forest edges and watercourses for commuting and foraging. Bat activity was generally low (albeit variable) across the BSA and seasons, and the species assemblages largely comprised common and widespread species. However, the installation of turbines near linear features, particularly watercourses, is likely to pose a mortality risk to bats and may also disrupt their commuting and foraging. The loss of a small number of individuals from a small population can have a substantial effect on the local population and may adversely affect the distribution of bats.

Therefore, the Proposed Development could have an adverse effects on bats in terms of their mortality and population viability within the BSA. By observing a 50m buffer between turbine blades and forest edges and watercourses, both potential effects are reduced.

8.189 In considering the above, the significance of likely effect on bats is detailed in **Table 8.21**. Significance is assessed within the context of the Ecological Importance of the BSA for bats (see **Table 8.10**).

Table 8.21: Assessment of Significance of Likely Operational Effects – Bats

Parameter	Likely Effect	
	Habitat Fragmentation	Mortality
Extent	Turbine areas where commuting and foraging lines may be severed.	Turbine areas where collision and/or barotrauma may be experienced.
Magnitude	Very low. Likely limited to a small number of potential foraging and commuting routes. Other routes will persist.	Low given the moderate levels of activity across the BSA; however the loss of a small number of bats from small populations will be proportionally high and will affect the bat population of the Study Area.
Duration	Operational lifetime of Proposed Development.	Operational lifetime of Proposed Development.
Frequency	Potentially repeatedly during operational lifetime.	Potentially repeatedly during operational lifetime.
Reversibility	Irreversible at an individual level, but reversible at the population level, albeit slowly.	Reversible upon decommissioning.
Likelihood	Probable	Probable
Significance (EclA)	Not significant	Significant (at Study Area level)
Significance (EIA)	Not significant	Minor significance

Proposed Mitigation

8.190 Operational effects on bats were the only potential operational effect identified. However, these were only significant at the Study Area level, therefore this is not considered to be significant in the context of the EIA Regulations (refer to **Table 8.4**), and therefore no specific mitigation is required.

8.191 However, the SPP will include details of a programme of bat mortality monitoring once the Proposed Development is operational. Should this monitoring result in concerns at specific locations, additional measures would be considered that alter the blade rotation to reduce the risks to bats, for example reduced rotation speed while idling and/or curtailment of specific turbines during periods of high risk².

Residual Operational Effects

8.192 Pre-mitigation assessment of effects identified significant effects in relation to bats during the operational phase. However, these operational effects are significant only at the Study Area level, therefore these are not significant in EIA terms. All other operational effects were assessed as being not significant.

Predicted In-Combination Effects with the Blade Transfer Areas during Construction

8.193 Two potential blade transfer areas are considered for possible in-combination effects on important ecological features. These areas have not been subject to detailed field survey, and so the assessment is based on a desk study of available information. Each area would be approximately 150 x 40m in size (0.6ha) and access would be taken from an adjacent to a public road.

8.194 The Blade Transfer Areas (BTAs) are described in **Chapter 4** in detail and shown on **Figure 4.16**.

Designated Sites

8.195 Effects on statutory and non-statutory designated sites have been scoped out of the assessment with regards to the Proposed Development. As such, no in-combination effects on designated sites are predicted.

Habitats

8.196 Due to the distance of the BTAs from the Proposed Development, and the small area of each BTA, no in-combination effect of habitat fragmentation is considered.

Blade Transfer Area 1

8.197 Based on aerial and ground-level imagery³⁸, the habitat at BTA1 includes abundant rushes *Juncus* spp. and so is likely to be a form of marshy grassland. Rush-dominated marshy grasslands were located along the proposed access route within the ESA.

8.198 In a lowland situation such as this, these marshy grassland habitats also have potential to be the SBL priority habitat Purple Moor Grass and Rush Pastures. However, this SBL habitat is not present in the ESA.

8.199 Such habitats have potential to be GWDTE, although a watercourse is noted to be present along the north of the field, indicating a likely surface-water component.

8.200 The Proposed Development will result in a loss of rush-dominated habitat (0.7ha), and the loss of marshy grassland at BTA1 would increase the overall loss to approximately 1.3ha. However, this habitat type is common and widespread in the landscape, and the loss of marshy grassland within the ESA was not considered significant, therefore the in-combination effects on marshy grassland habitats are predicted to be **not significant**.

Blade Transfer Area 2

8.201 Aerial and ground-level imagery indicates that the area of BTA2 has been subject to forestry ground-preparation methods and planting in recent years. The habitat therefore largely comprises young coniferous plantation, which is not considered to be an important ecological feature.

8.202 There is a screen of scrub (including non-native rhododendron *Rhododendron ponticum*) and native broadleaved trees between the plantation and the A83. An additional access would be required to be taken through this screening, and this would result in the removal of some of this vegetation, and may require removal of some semi-mature broadleaved trees.

8.203 The Proposed Development will result in a small extent of broadleaved felling (0.96ha). However, broadleaved trees are common in the wider landscape, and the loss of mature broadleaved trees within the ESA was not considered significant. As such, the in-combination effects on broadleaved woodland habitats are predicted to be **not significant**.

Protected Species

Bats

8.204 Both BTAs are at some distance from the Proposed Development, and therefore in-combination effects with regards to habitat fragmentation and disturbance are not considered.

8.205 Aerial and ground-level imagery does not indicate the presence at BTA1 of mature trees or structures with bat roost potential. Semi-mature birch *Betula* sp. trees are present at BTA2 along the side of the A83, and some of these may require removal to facilitate an additional access point. Although these trees appear to be at most semi-mature, there may be features with potential to support roosting bats. In addition, a small number of trees with bat roost potential along the existing track may require to be felled or limbed to facilitate the access route of the Proposed Development.

8.206 It is assumed that the measures set out in the 'Good Practice Measures' section will be implemented both the Proposed Development and BTA2. This would include the implementation of best practice with regards to surveys of trees for bat roost potential, comprising pre-construction surveys of trees that will be affected, further detailed survey if suitable features are recorded, and, if bat roosts are confirmed, adherence to the licensing process for roosting bats.

³⁸ Ground level imagery obtained from Google Street View and Google Maps

8.207 The in-combination effects on bats is considered to be **not significant**.

Otter

8.208 Both BTAs are some distance from the Proposed Development, and therefore in-combination effects on otter of habitat fragmentation and disturbance are not considered.

8.209 Both BTAs have watercourses within or adjacent which could be used by otter, and there may be otter resting-up sites that could be affected. BTA1 has a mapped watercourse within the northern boundary of the field, while BTA2 has a watercourse along its southern boundary. However, field signs of otter within the ESA was limited, and no resting-up sites were recorded. In addition, the BTAs are both distant from the Site; BTA1 is not hydrologically connected to the Site, although BTA2 is connected to the Site via Loch Fyne. Otter occupy long, riparian territories, the length of which will vary according to a range of factors³⁹; however, given the distances from the Site, it is considered unlikely that the BTAs would have in-combination effects with regards to habitat loss for otter.

8.210 If otter are passing through either of the BTAs, there is potential for mortality, and this could affect the wider population. However, it is assumed that measures described in 'Good Practice Measures' will be implemented, including pre-construction surveys, implementation of the SPP and engagement of the licensing process if otter resting-up sites are found. Mortality of otter as a result of construction at the Site and the BTAs is therefore assessed to be unlikely.

8.211 In-combination effects on otter are therefore considered **not significant**.

Badger

8.212 Due to the distance from the Site, in-combination effects on badger are not considered with regards to disturbance.

8.213 No evidence of badger was recorded within the ESA, although this species is expected to be present in the wider area. The habitats that form the bulk of the Site are exposed upland habitats with limited potential for use by badger, while the access route through the forest plantation largely follows an existing track.

8.214 It is possible that badger may be present at either of the BTAs; however, the rush-dominated habitat at BTA1 is unlikely to provide conditions for sett-building. The habitats at BTA2, including the strip of scrub and the wider plantation forestry, may offer more suitable habitat. However, badger density in Argyll and Bute appears to be relatively low⁴⁰, and social group territories are likely to be correspondingly relatively high; each BTA (approximately 0.6ha) would therefore be expected to form only a small proportion of the territory of any badger social group in the area.

8.215 If badger are utilising the habitats of the BTAs, there is potential for mortality, and this could affect the wider population. However, measures described in 'Good Practice Measures' are expected to be implemented, including pre-construction surveys, implementation of the SPP and engagement of the licensing process if setts are found. The likelihood of mortality as a result of construction at the Site or the BTAs is therefore minimal.

8.216 In-combination effects on badger are therefore considered **not significant**.

Red Squirrel

8.217 Red squirrel were confirmed to be present in the forestry plantation along the access route of the Proposed Development, although the majority of the Site comprises open moorland that has no suitability for red squirrel. Similarly, the habitats at BTA1 are open and offer no potential for red squirrel, although they may be present in nearby woodland. The trees planted at BTA2 are not yet of sufficient size to be use by red squirrel; again, the species may be present in more mature stands of woodland in the surroundings. As red squirrel prefers to stay in the canopy, this species is not expected to make use of the habitats at either BTA.

8.218 Due to the distance of the BTAs from the Site, and the limited potential for red squirrel to utilise either the habitats within the Site or those at the BTAs, in-combination effects on red squirrel are assessed to be **not significant**.

Pine Marten

8.219 As the BTAs are at some distance from the Site, in-combination effects on pine marten via habitat fragmentation and disturbance are not considered.

8.220 Pine marten was confirmed to be present within the ESA, and this species can make use of a wide range of habitat types, including those habitats that are present within and surrounding the BTAs. In addition, pine marten can have large home territories (up to 32km² for males in upland plantations⁴¹). The BTAs are at significant distance, and so it seems unlikely that the Site and the BTAs would be part of the same territory; nevertheless, loss of habitat within a territory could result in additional pressure on resources where territories overlap. However, the extent of potential habitat loss at the Site is limited, and at the BTAs it amounts to approximately 0.6ha each, therefore overall potential habitat loss is considered to be minimal.

8.221 Pine marten are likely to at least occasionally pass through either of the BTAs, and the wider population could be affected should there be mortality associated with construction activities. However, it is assumed that measures described in 'Good Practice Measures' will be implemented, including pre-construction surveys, implementation of the SPP and engagement of the licensing process if pine marten dens are found. Pine marten mortality as a result of construction at the Site and the BTAs is therefore assessed to be unlikely.

8.222 In-combination effects on pine marten are therefore considered **not significant**.

Water Vole

8.223 Upland water voles exist as a metapopulation³³. However, the distance of the BTAs is such that from the Site limits the potential for in-combination effects on water vole. As such, disturbance is not considered, although the potential for in-combination effects of direct habitat loss, habitat fragmentation and mortality is assessed here.

8.224 The rush-dominated habitat at BTA1 is unlikely to be optimal as there does not appear to be an extent of slow-moving water, although water vole presence cannot be ruled out. The plantation habitat at BTA2 does not offer potential, although a watercourse is present along the roadside. However, this is surrounded by scrub and trees and does not offer the open conditions that water vole require.

8.225 Assuming that measures described in 'Good Practice Measures' are implemented, including pre-construction surveys, implementation of the SPP and engagement with the licensing process if water vole are found to be present, in-combination effects on water vole are considered **not significant**.

Proposed Mitigation

8.226 No significant in-combination effects are expected and so no additional mitigation measures are considered necessary.

Residual In-Combination Effects during Construction

8.227 The assessment has not identified any residual in-combination effects during construction.

Predicted In-Combination Effects with the Blade Transfer Areas during Operation

Protected Species

8.228 Operational effects of the Site have been scoped out for all important ecological features other than bats.

Bats

8.229 Direct habitat loss is not considered a likely effect on bats during operation at either the Site or the BTAs. In addition, due to the distance of the BTAs from the Site, in-combination effects on bats via habitat fragmentation are not considered.

8.230 While the operation of the BTAs may require lighting that could result in disturbance to bats, disturbance is not considered to be a likely effect of the operation of the Proposed Development.

8.231 The activities undertaken at the BTAs during operation are not considered likely to result in mortality to bats.

8.232 In-combination effects on bats during operation are therefore considered **not significant**.

³⁹ Kruuk, H. Carss, D.N., Conroy, JWH and Durbin, L. (1993) Otter *Lutra lutra* numbers and fish productivity in rivers in N.E. Scotland. Symposia of the Zoological Society of London, 65:171-191.

⁴⁰ Rainey, E., Butler, A., Bierman, S. and Roberts, A.M.I. (2009) Scottish Badger Distribution Survey 2006 – 2009: estimating the distribution and density of badger main setts in Scotland. Report prepared by Scottish Badgers and Biomathematics and Statistics Scotland.

⁴¹ Balharry, D. (1993) Factors Affecting the Distribution and Population Density of Pine Martens (*Martes martes*) in Scotland. PhD Dissertation. University of Aberdeen, Aberdeen. Cited in: Birks, J. D. S. (2002) The Pine Marten. The Mammal Society, London.

Proposed Mitigation

8.233 No significant in-combination effects are expected and so no additional mitigation measures are considered necessary.

Residual In-Combination Effects during Operation

8.234 The assessment has not identified any residual in-combination effects during operation.

Cumulative Effects

8.235 In this section, the potential cumulative effects of the Proposed Development and other wind farm developments in planning within a 5km search area are considered. Operational wind farms are not considered in this cumulative assessment of effects because the baseline conditions at An Càrr Dubh have already been influenced by the existing wind farms in operation within 5km. Thus, assessing the cumulative effects of operational wind farms along with the effects anticipated for the Proposed Development at An Càrr Dubh will equate to double-counting of effects.

8.236 Therefore, one wind farm has been considered within this cumulative impact assessment: Blarghour Wind Farm, which lies directly north of the Proposed Development. This wind farm is in the design/Scoping stage having been previously consented. As such, the cumulative assessment presented here is based on the EIA for the consented Blarghour scheme.

Predicted Cumulative Effects during Construction

8.237 Only those wind farm developments that have not already been constructed are considered in this assessment, therefore only Blarghour Wind Farm⁴² is considered.

Habitats

8.238 Only those habitats of conservation interest recorded within the ESA are included in this assessment. **Table 8.22** below shows a summary of habitat loss for the developments included in this assessment.

Table 8.22: Summary of Cumulative Habitat Losses⁴³

Habitats of Conservation Interest Present Within An Càrr Dubh Wind Farm	Wind Farm Development	
	Proposed Habitat Loss (ha) Within An Càrr Dubh	Proposed Habitat Loss (ha) Within Blarghour ⁴³
A1.1.1 Broadleaved woodland, semi-natural (W4 only)	0.0	0.85
B5 Marshy grassland (M23 only)	0.7	0.0
D1 Dry dwarf shrub heath D5 Dry heath/acid grassland mosaic	1.0	0.34
D2 Wet dwarf shrub heath D6 Wet heath/acid grassland mosaic	1.5	0.24
Bog communities (NVC: M2, M3, M4, M17, M19, M20, M25)	21.2	-
E1.6.1 Blanket bog	-	11.21
E1.7 Wet modified bog	-	0.61

⁴² Blarghour Wind Farm Limited (2018) Blarghour Wind Farm Environmental Statement, Volume 2: Main Report, Chapter 5: Ecology.

⁴³ Figures adapted from Table 5.15 in Chapter 5 of the Blarghour Wind Farm Environmental Statement to account for habitat mosaics. Habitats assumed to be present in mosaics on a 1:1 basis.

Total bog communities/habitats	21.2	11.82
E2.1 Acid/neutral flush	0.0	0.02
E2.2 Basic flush	0.0	0.0
E2.3 Bryophyte-dominated spring	0.0	0.0

8.239 **Table 8.22** above shows that the cumulative loss of habitats of conservation interest within 5km of this Proposed Development is predicted to be very low. Across both developments, the largest habitat losses are approximately 33ha of blanket bog (including wet modified bog at An Càrr Dubh). However the scale of the losses, viewed in terms of the proportions of these habitats within the wider landscape, are small. Nevertheless, the cumulative loss of blanket bog habitats is considered significant at a Local level (in EclA terms).

8.240 Large extents of peatland restoration are proposed within the Site (see **Chapter 7**) and at Blarghour. Within the Site, this amounts to 133ha of reprofiled and/or restored eroded peat and 310ha of peatland safeguarded as a result of blocking of drains (see **Appendix 7.3**). Similar measures will be implemented at Blarghour to protect and restore peatland habitats, with the extent in relation to the consented scheme reported to be up to 178ha⁴⁴. Although the Site and Blarghour are not hydrologically connected, being separated by the Allt Blarghour, they are adjacent and so this will result in benefits to the peatland resource (and ecological features that utilise these habitats) over a wide, coherent area.

8.241 Although there is a cumulative loss of habitats of conservation interest, particularly of bog habitats, nevertheless in the light of the extensive restoration proposed it is therefore considered that cumulative effects on the conservation status of these habitats will be **not significant**.

Protected Species

Bats

8.242 No bat roosts were recorded during the ecology surveys at Blarghour. This is likely due to the Site being predominantly commercial conifer plantation forestry and open upland habitats, therefore largely unsuitable to support roosting bats. Additionally, surveys recorded low activity of bats across the Site. Four species were recorded (common pipistrelle, soprano pipistrelle, Daubenton's bat and brown long-eared bat), with the highest activity being along the edge of plantation forestry.

8.243 Some forestry clearance is planned for Blarghour, although given the lack of potential roost features identified this is not considered to affect roosting bats. A small number of trees with bat roost potential may require removal or limbing to facilitate the Proposed Development. However, suitable mitigation will be implemented, to include pre-construction surveys in the season prior and adherence to the licensing process as necessary. As such, no significant effect is predicted, and no cumulative effect on roosting bats is therefore expected.

8.244 At both Blarghour and the Proposed Development, the potential for habitat fragmentation has been considered. Some woodland clearance will take place at Blarghour, although it is noted that re-stocking would occur. Minimal tree removal is required to facilitate the Proposed Development as the access route will largely utilise an existing track. Woodland removal may result in the displacement of bats into other areas; however, in commercial forestry, these types of operations are an ongoing feature. In addition, such work is usually phased which may reduce the magnitude of the displacement as habitat will remain present and available to bats (i.e. forestry will not all be removed at once over a short period of time). Where limited felling is proposed, new edge features will be created which could be beneficial for bats.

8.245 In summary, given the relatively low numbers of common bat species recorded at both sites, combined with the proposed approaches that will conform to standard best practice with regards bats and forestry operations, cumulative effects are considered unlikely and **not significant**.

⁴⁴ Botanaeco (2019). Blarghour Wind Farm: Peat Management Plan.

Otter

8.246 Evidence of otter recorded during ecology surveys for Blarghour was limited to old spraints and feeding remains. No resting sites were identified, although the habitats onsite were considered suitable for occasional use by foraging and commuting otter. Given the secrecy of holts, particularly of natal holts, preconstruction surveys have been recommended at Blarghour and the Proposed Development.

8.247 Potential effects on otter include collisions with site vehicles, disturbance (from construction activities) and watercourse pollution. Good practice construction measures across both Blarghour and the Proposed Development, including buffer zones from watercourses, will reduce the risk at both locations. Cumulative effects are therefore considered unlikely and **not significant**.

Badger

8.248 No evidence of badger has been recorded during the ecology surveys for either Blarghour or the Proposed Development. Habitats at Blarghour and the Proposed Development are considered to have limited suitability for badgers. Given the lack of evidence of badger within the Blarghour site, badger were scoped out of further assessment.

8.249 The presence of this species at low density in the upland landscape cannot be ruled out. Given the availability of more favourable habitats in the wider landscape and proposed mitigation measures at both Blarghour and the Proposed Development (including pre-construction surveys), cumulative effects on badger are considered unlikely and **not significant**.

Red Squirrel

8.250 No evidence of red squirrel was recorded during surveys at Blarghour. and this species was scoped out of further assessment. Limited evidence of red squirrel was noted during surveys for the Proposed Development, with two squirrels seen near to Inveraray. As noted, dense conifer plantation is difficult to survey, although as such habitats comprise a monoculture of commercial forestry they offer limited suitability for red squirrel. Due to the prevalence of commercial forestry in the wider area it is considered that red squirrel are accustomed to a certain level of disturbance from forestry activities. Minimal tree removal is proposed to facilitate the proposed access route, and best practice methods, including pre-construction surveys, will be in place thereby reducing the risk to red squirrel.

8.251 For the above reasons, adverse cumulative effects on red squirrel are considered unlikely, and therefore **not significant**.

Pine Marten

8.252 No evidence of pine marten was recorded during surveys at Blarghour. and this species was scoped out of further assessment. Limited evidence of pine marten was noted during surveys for the Proposed Development, with two scats recorded, and an individual pine marten seen outwith the Site.

8.253 Habitat suitability is generally sub-optimal at both Blarghour and the Proposed Development. Pine marten prefer old growth woodland with a varied age and species structure, with mature trees which offer cavities in which they can shelter and breed. The forestry across the wind farm sites is largely a monoculture of semi-mature conifer plantation. However, dense conifer plantation is difficult to survey, so there may be sporadic areas of mature trees. In addition, pine marten have large home ranges. This species is therefore considered to be present at low density. Minimal tree removal is proposed to facilitate the proposed access route, and best practice methods, including pre-construction surveys, will be in place thereby reducing the risk to pine marten.

8.254 For the above reasons, adverse cumulative effects on pine marten are considered unlikely, and therefore **not significant**.

Water Vole

8.255 Limited evidence of water vole was recorded at Blarghour; a cluster of signs and burrows was recorded in 2014, but no evidence was seen in subsequent years⁴². Due to a lack of evidence of the continued presence of the species, water vole was scoped out from further assessment.

8.256 Water vole signs have been confirmed at the Proposed Development, both in the most recent surveys and in previous years in relation to Ardchnonnel wind farm. The species occurs as a metapopulation in upland habitats, and local colonisations and extinctions across years are to be expected. The two sites are hydrologically linked, and during surveys for the Proposed Development water vole signs were noted on the Allt Blarghour, within the study area of Blarghour. It is possible that this is a more recent colonisation.

8.257 The potential effects identified of the Proposed Development on water vole include habitat fragmentation and mortality, and these effects could also be felt within the Blarghour site if water vole have moved into the study area, as appears likely. Although the

species was not identified within the Blarghour study area at the time of the corresponding EIA, standard mitigation measures have been identified including a commitment to ensure no insurmountable physical barriers at watercourse crossings and pre-construction surveys for protected terrestrial mammal species⁴². These same mitigation measures will be implemented with regards to the Proposed Development. As such, any new or existing colonies impacted by the neighbouring Blarghour wind farm would be identified, and suitable licensing and mitigation would be implemented, as is the case with regards the Proposed Development. The risk of habitat fragmentation and of mortality of water voles will be reduced. Cumulative effects on water vole are considered unlikely and **not significant**.

Predicted Cumulative Effects during Operation

8.258 Bats are the only ecological feature considered in the cumulative assessment of operational effects.

Protected Species

Bats

8.259 Habitats across both the Proposed Development and Blarghour are dominated by open upland habitats with areas of commercial forestry. These habitats are considered low value to bats as they offer less profitable foraging (due to fewer insects) and fewer roosting opportunities (due to the absence of suitable features e.g. buildings and trees with cavities/crevices) than other habitats such as natural woodlands. This habitat assessment is supported by the absence of roosts and the low to moderate levels of bat activity, recorded across the developments.

8.260 Of the bat species that were recorded, the most common species for both developments were common pipistrelle, soprano pipistrelle and *Pipistrellus* sp. According to the most recent NatureScot guidance², these species are high-risk in terms of collision⁴⁵ and their populations are considered to have medium vulnerability in Scotland.

8.261 It is widely accepted that common bat species favour linear features such as forest edges and watercourses for commuting and foraging. Any turbines located on, or close to, these features may increase risk of mortality to bats. Furthermore, key-holing of forestry (as is planned at Blarghour) may create additional features (the 'edge effect') which has the potential to draw bats into turbine locations and may increase collision risk. The potential operational effects considered at Blarghour, and at the Proposed Development, were habitat fragmentation and mortality.

8.262 Despite the low to moderate levels of bat activity and the absence of roosts, there is potential for there to be a cumulative adverse effect on bats during operation. Given the status of the most common species recorded as high-collision risk, and the species' population vulnerability (medium), together with the survey evidence that bat populations across the developments are relatively low, the loss of a small number of bats from a small local population has the potential to have a significant effect.

8.263 However, there are mitigation measures that have been embedded into the design of both Blarghour and the Proposed Development with the aim of avoiding/minimising bat fatalities. In accordance with NatureScot guidance², a 50m (minimum) buffer will be preserved between blade tip and key habitat features such as forest edges and watercourses to minimise collision risk and barotrauma at the Proposed Development.

8.264 The NatureScot guidance was published after the Blarghour EIA had been submitted, although a commitment to a 50m buffer around all watercourses was made (assumed to turbine base, not turbine tip). However, the development is currently going through a further round of design/Scoping, with a proposal to increase the tip height of the consented scheme. As such, it is anticipated that the most up-to-date guidance will require to be followed to preserve at least a 50m buffer between turbine blade tips and both forest edges and watercourses.

8.265 Assessments of both the Proposed Development and Blarghour have concluded that effects on bats will be not significant and that, given the nature of the species and their relatively low use of each site, the local bat population will remain viable. Therefore cumulative effects on bats during operation will be **not significant**.

⁴⁵ In NatureScot guidance, 'collision' is taken to mean any form of injury or mortality associated with the operation of wind turbines, i.e. it includes

barotrauma.

Interrelationship between Effects

8.266 The potential for interrelationships between effects has been considered, specifically inter-relationships between effects described in **Chapter 9** and effects described in **Chapter 7**. No notable inter-relationships have been identified in this assessment with the exception of the discussion on GWDTEs noted above.

Further Survey Requirements and Monitoring

8.267 The development of an integrated monitoring plan is a key commitment in the OREP (**Appendix 8.5**). Commissioning of the monitoring required under this plan will be the responsibility of the OREP Steering Group. This will include:

- Vegetation monitoring of unfenced areas to assess the condition of vegetation and to ensure no deleterious effects on unfenced habitats.
- A monitoring regime to establish current occupied water vole habitat and unoccupied but suitable habitat on key watercourses (e.g. the Eas an Amair and tributaries of the Allt Blarghour), and establishment of a mink raft or rafts and regular monitoring in key locations.
- Monitoring of planted trees to assess their success of establishment and ongoing health with regards to disease or grazing.

8.268 In addition, the need to update protected species surveys prior to construction will be addressed in the SPPs, as will ongoing monitoring requirements. This will include the following:

- Pre-construction bat surveys of trees with bat roost potential that require to be felled or limbed, or which could be disturbed by increased site activity.
- Pre-construction surveys of all water-crossings immediately prior to construction (i.e. with season immediately prior) to assess use of the locations by otter and water vole.
- Pre-construction surveys of proposed infrastructure routes within forested areas no more than six months prior to construction, to assess the current status with regards badger, red squirrel and pine marten.
- Pre-construction fish habitat surveys in the season prior, to micro-site the crossings away from potentially sensitive habitats wherever possible, and to confirm the habitat baseline within a buffer of up to 100m upstream and downstream.
- Monitoring of a range of ecological features by the ECoW throughout construction of the Proposed Development.
- Post-construction fish habitat surveys and monitoring to ensure mitigation measures are effective, that crossings maintain fish passage, and that potentially sensitive habitats are retained, and to identify any requirement for improvements or remedial works.
- A programme of bat mortality monitoring once the Proposed Development is operational.

8.269 The SPPs will also include a programme of bat mortality monitoring once the Proposed Development is operational.

Summary of Significant Effects

8.270 **Table 2.23** below summarises the predicted significant effects of the Proposed Development on Ecology prior to and following mitigation.

8.271 No significant effects on ecology in EIA terminology (i.e. effects considered ‘Major’ or ‘Moderate’ as per **Table 8.4**) were identified prior to, or following, the application of mitigation.

Table 8.23: Summary of Significant Effects

Predicted Effect	Significance (in EclA)	Mitigation	Significance of Residual Effect (in EIA)
Construction			
Direct habitat loss of habitats of national importance (including peatland)	Significant (at Study Area level)	Implementation of peatland restoration and enhancement	Minor (positive), Not significant

Predicted Effect	Significance (in EclA)	Mitigation	Significance of Residual Effect (in EIA)
		measures proposed in OREP and OPMP to include: <ul style="list-style-type: none"> ■ Extensive restoration of areas of damaged and eroded peat within the Site, including reprofiling and infill (approximately 133ha). ■ Blocking of drains thereby safeguarding and improving approximately 310ha of peatland. 	
Direct habitat loss of roosting sites within trees	Significant (at Study Area level)	Trees with bat roost potential will be retained and protected where possible. All trees to be felled or limbed (or which could be disturbed by increased site activity) to be surveyed for bat activity immediately prior to construction (i.e. within season immediately prior). If bat roosts identified, licensing process to be followed, which will include the provision of alternative roosting features in adjacent trees.	Negligible, Not significant
Mortality of bats as a result of removal of trees with bat roost potential	Significant (at Study Area level)		Negligible, Not significant
Habitat fragmentation affecting the metapopulation of water vole within the catchment	Significant (at Local level)	Pre-construction surveys of all water-crossings (i.e. within survey season for water vole immediately prior). Micrositing to avoid any new burrows identified during update surveys. If unavoidable, ECoW to make necessary protected species licence applications. All water-crossings to be mammal friendly, with banksides retained or mammal ledges installed. Water vole monitoring as part of the OREP.	Minor, Not significant
Mortality of water voles as a result of construction activity at watercourses	Significant (at Study Area level)		Negligible, Not significant
Operation			
Mortality of bats due to collision with turbines	Significant (at Study Area level)	The SPP will include details of a programme of bat mortality monitoring once the Proposed Development is operational. Additional measures will be considered if this monitoring	Negligible, Not significant

Predicted Effect	Significance (in EcIA)	Mitigation	Significance of Residual Effect (in EIA)
		identifies locations of specific concern.	
Cumulative Construction			
Effects on peatland	Significant (at Local level)	<p>Implementation of peatland restoration and enhancement measures proposed in OREP and OPMP to include:</p> <ul style="list-style-type: none"> ■ Extensive restoration of areas of damaged and eroded peat within the Site, including reprofiling and infill (approximately 133ha). ■ Blocking of drains thereby safeguarding and improving approximately 310ha of peatland. <p>Similar measures will be implemented at Blarghour (up to 178ha reported in relation to the consented scheme)⁴⁴.</p> <p>Extensive peatland restoration measures will therefore be implemented across the two adjacent sites.</p>	Minor (positive), Not significant