11. Ecology

Non-Technical Summary

11.1 The scope of the ecological assessment was determined through a combination of desk study to identify existing biological data relating to Tom na Clach Wind Farm Extension (hereafter referred to as the 'Proposed Development') and the surrounding area, site survey and consultation with relevant stakeholders.

11.2 A Phase 1 habitat survey was undertaken across the site and detailed National Vegetation Classification (NVC) surveys were completed. Surveys and habitat assessments for otter *Lutra lutra*, water vole *Arvicola amphibius*, pine marten *Martes martes*, bats and fish were also undertaken. The assessment has also considered effects on badger *Meles meles*, red squirrel *Sciurus vulgaris*, Scottish wildcat *Felis sylvestris* and reptiles. The results of previous survey work completed in support of Tom nan Clach Wind Farm (hereafter referred to as the 'Operational Scheme') have been used to inform the ecological baseline.

11.3 The site is dominated by degraded blanket bog that is evaluated as being of County level importance. Other habitats that are present include wet heath, acid flush, acid grassland and running water.

11.4 The results of surveys indicate that the Proposed Development site may occasionally be used by otter but there is no resident population of this species. Low levels of bat activity were recorded, with common pipistrelle being the most frequently encountered species. Fish surveys found that watercourses within the site support a resident brown trout population with no other species present. No evidence was found to indicate that badger, water vole, pine marten and wildcat are present.

11.5 No effects are likely on any designated features of statutory nature conservation sites.

11.6 The design of the proposed scheme has sought to avoid the most valuable areas of habitat. The proposed mitigation is primarily in the form of minimising the risks of potential disruption to sensitive habitats, including wetlands and watercourses, and minimising potential disturbance of protected species. Measures include the completion of pre-construction surveys for otter, the use of appropriately designed lighting schemes (if required), and the adoption of best practice measures to minimise pollution of watercourses.

11.7 It is predicted that the Proposed Development would not have residual effects on important ecological features that are significant in relation to local or national planning policy or legislative requirements.

11.8 No significant effects on important ecological features are likely when the Proposed Development is considered in combination with other plans and projects.

Introduction

11.9 This Chapter of the Environmental Impact Assessment Report (EIA Report) has been prepared by BSG Ecology Ltd. and provides an assessment of potential effects on ecological features in relation to the construction, operation and decommissioning of the proposed Tom na Clach Wind Farm Extension ('the Proposed Development').

11.10 This chapter is supported by several technical appendices:

- Tom na Clach Wind Farm Extension: Habitat and vegetation survey (PlantEcol Ltd, 2021) (Technical **Appendix 11.A**);
- Tom na Clach Wind Farm Extension: Bat Survey Report (BSG Ecology, 2022) (Technical **Appendix 11.B**);
- Tom na Clach Wind Farm Extension: Protected Species Survey Report (BSG Ecology, 2022) (Technical **Appendix 11.C**);
- Tom na Clach Wind Farm Extension: Survey of fish habitats and populations (Waterside Ecology, 2021) (Technical **Appendix 11.D**).

11.11 In addition, an outline HMP is presented in **Appendix 11.E**.

Policy guidance and legislation

11.12 The completion of an assessment of impacts on ecological features necessarily needs to consider the requirements of relevant legislation as well as local and national planning policy. This chapter refers to the following legal instruments:

- The EC Habitats Directive (Directive 92/43/EEC) as translated into UK law by the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) (referred to as the Habitats Regulations);
- Surface Waters (Fishlife) (Classification) (Scotland) Regulations 1997 (as amended);
- Wildlife and Countryside Act 1981 (as amended by the Wildlife and Natural Environment (Scotland) Act 2011);
- The Protection of Badgers Act 1992 (as amended by the Wildlife and Natural Environment (Scotland) Act 2011);
- Wild Mammals (Protection) Act 1996;
- Deer (Scotland) Act 1996;
- Nature Conservation (Scotland) Act 2004;
- The Scottish Biodiversity List (SBL) prepared in accordance with the Nature Conservation (Scotland) Act 2004;
- The EC Water Framework Directive (Directive 2000/60/EC) with regard to groundwater dependent terrestrial ecosystems (GWDTEs); and
- The Wildlife and Natural Environment (Scotland) Act 2011.

11.13 Consideration has also been given to the following policy documents:

- Scottish Planning Policy (SPP) (June 2014) and online renewables planning advice;
- Planning Advice Note (PAN) 60: Planning for Natural Heritage (updated 2008);
- Highland Wide Local Development Plan (HWLDP) – adopted 2012. In particular: Policies 51 (Trees and Development); 52 (Principle of Development in

Woodland); 55 (Peat and Soils); 57 (Natural, Built and Cultural Heritage); 58 (Protected Species); 59 (Other Important Species); 60 (Other Important Habitats and Article 10 Features); 63 (Water Environment); and 67 (Renewable Energy Developments).

11.14 There are a number of guidance documents that are relevant in the context of this assessment and those that have been considered are as follows:

- Land Use Planning System SEPA Guidance Note 4 (LUPS-GU4): Planning Guidance on on-shore wind farm developments (SEPA, 2017);
- Land Use Planning System SEPA Guidance Note 31 (LUPS-GU31): Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (SEPA, 2014);
- Scottish Natural Heritage 'Assessing the cumulative impact of onshore wind energy developments', August 2018;
- Scottish Natural Heritage guidance on protected species (https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species); and
- Good Practice during Wind Farm Construction (Joint publication by: Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science and AECoW, 4th Edition, 2019).

11.15 Whilst the specific actions in a Biodiversity Action Plan (BAP) cannot be enforced in law and failure to follow them does not create an offence, they are produced as a result of a statutory 'biodiversity duty' on all public bodies and they do provide a useful source of information on ecological features (species and habitats) that require conservation action. The Highland Biodiversity Action Plan 2015-2020[1] (HBAP) has therefore been considered in this assessment.

Scoping

11.16 The scope of this assessment was initially derived from a general understanding of wind farm related activities and interactions with ecological features (species and habitats). The scope considers the potential for ecological features to be significantly affected and has been informed by the results of a desk study and previous surveys completed to inform the EIA for the operational Tom nan Clach windfarm (referred to as the 'Operational Scheme') in 2014.

11.17 NatureScot was consulted in 2021 regarding the scope of the ecological assessment for the Proposed Development. The key points identified in their scoping response are summarised as follows:

- All natural heritage assessments should follow NatureScot published guidance.
- The proposal is within 3 km of Carn nan tri-tighernan Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), Findhorn

[1] https://www.highlandenvironmentforum.info/biodiversity/action-plan/

Terraces SSSI and Allt A'Choire SSSI. These sites are designated for their upland habitats, fluvial geomorphology and quaternary geology. As existing access will be used, and these sites lie some distance from the site boundary, they are unlikely to be affected by the proposal. Based on currently available information it is likely they can be scoped out of detailed assessment.

- The potential for indirect impacts on designated sites should be considered through, for example, changes to deer movements during the construction period affecting upland SAC habitats.
- Annex 1 habitats should be mapped to NVC level for the development site plus an appropriate buffer, including any areas where access track upgrades and borrow pits may be proposed.
- Habitat loss and damage, both direct and indirect, should be determined and suitable mitigation and/or restoration measures presented in a Habitat Management Plan.
- Protected species surveys should cover all areas which could be affected by the proposed development. Assessment for bats should follow the 2019 guidance [SNH *et al*., 2019]. The protected species advice on the NatureScot website should be followed.

11.18 SEPA requested that NVC surveys should be carried out for any wetlands identified, with the results of these findings (including the identification of Ground Water Dependant Terrestrial Ecosystems (GWDTEs[2])) included in the Environmental Impact Assessment Report ('EIA Report') along with appropriate maps and the locations of infrastructure.

Results of the Scoping process

11.19 Taking into account the results of consultations for both the Operational Scheme and the Proposed Development, the results of previous ecological survey completed for the Operational Scheme, the scope of the ecological assessment was defined as follows:

- Consideration of how the development may affect the ecological interest features of statutory and non-statutory designated sites of nature conservation importance;
- Identification and classification of habitats within the site using the Phase 1 Habitat Survey methodology;
- Completion of National Vegetation Classification (NVC) survey of potential Ground Water Dependent Terrestrial Ecosystems (GWDTEs) and habitats within 300 m of proposed infrastructure and turbine locations;
- Completion of surveys for otter, water vole, wild cat, pine marten, bats, fish and fish habitats that may be present on site;

[2] GWDTEs are wetlands which critically depend on groundwater flows or chemistries. They are safeguarded by the Water Framework Directive (WFD) and are sensitive to hydrological and ecological changes caused by developments.

- Assessment of the impacts of construction, operation and decommissioning phases of the wind farm on important ecological features (species, habitats and designated sites) and the design of appropriate measures to mitigate significant impacts;
- Incorporation of habitat management and enhancement objectives;
- Identification of species protection and management measures for legally protected species;
- Consideration of potential effects on deer; and
- Identification of any ecological monitoring that may be required prior to or during the construction, operation and decommissioning of the Proposed Development, including the requirement to undertake pre-construction surveys.

11.20 Surveys for red squirrel and badger were scoped out of the assessment on the basis of the absence of records, the results of previous surveys and the sub-optimal nature of the habitats present to support these species. This was presented in the Scoping Report that was submitted prior to EIA being undertaken. Following the completion of initial habitat survey work, the requirement for amphibian surveys was also scoped out of the assessment for the same reasons as stated above.

11.21 The ecological assessment presented in this chapter of the EIA report has assumed that common reptile species may be present within the Proposed Development; however, the habitats present are poorly suited for these species given the dominance of degraded upland moorland / blanket bog habitat and the lack of good hibernation or refuge opportunities. These habitat characteristics mean that reptiles are likely to be present in low numbers only, if they are present at all (ARG UK, 2018). As such they are not considered to be Important Ecological Features (IEF), and no targeted surveys have been undertaken and nor have they been included within the EIA evaluation and formal impact assessment. Nevertheless, given the legal protection afforded these species they have been considered within the mitigation section on a precautionary basis, which sets out measures to avoid killing / injury should they be present in low numbers, or be present in the future.

Baseline methodology

Desk Study

11.22 A desk study was undertaken to collate existing information on the presence of designated sites for nature conservation and existing records of protected and notable habitats and faunal species, within the Site and surrounding area.

11.23 The following key sources were consulted:

- NatureScot Sitelink (https://sitelink.nature.scot/home);
- National Biodiversity Network (NBN) atlas (https://species.nbnatlas.org/);
- Highland Biological Recording Group (HBRG).

Field Survey

11.24 The results of surveys that were completed in 2014 to inform the Operational Scheme, have also been reviewed and incorporated into the summaries of ecological work completed in 2020 for historical context, where appropriate.

11.25 Detailed field survey methodologies are provided in **Appendix 11.A** (habitat survey), **Appendix 11.B** (bat survey), **Appendix 11.C** (protected species survey) and **Appendix 11.D** (fish survey)

Vegetation survey

11.26 A Phase 1 Habitat Survey was undertaken at the site in accordance with standard guidance (JNCC, 2010). This survey described the habitats present at the site and assessed the general conservation value of those habitats: it was also extended to assess the suitability of the habitats present to support protected species. During the survey, searches were made for signs of protected species such as feeding signs, droppings and tracks.

11.27 The requirement for and scope of National Vegetation Classification (NVC) survey (in relation to GWDTEs) was determined by applying the Functional Wetland Typology for Scotland (SNIFFER, 2009) whilst carrying out the Phase 1 Habitat Survey.

11.28 A survey of the vegetation types present was subsequently undertaken using the NVC methods outlined in Rodwell (1992a,b). Plant communities were mapped onto 1:10,000 scale base maps. Grid-referenced Target Notes (TN) were used as follows:

- to identify types of vegetation covering areas that were too small to be mapped;
- to identify unusual conditions; and
- to identify the species composition of different vegetation types.

11.29 Any non-native species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended by the Wildlife and Natural Environment (Scotland) Act 2012) were also recorded. The scientific names of plants and mosses were taken from Stace (2020). NVC survey did not include the hard-standing access track which is approximately 11.5 km in length extending from the B9007 to the Proposed Development as no works are currently proposed to this track (see **Chapter 3: Description of Proposed Development**).

11.30 The Phase 1 Habitat Survey and the NVC survey (and subsequent GWDTE assessment) were undertaken by PlantEcol in July 2019 (see Technical **Appendix 11.A**).

11.31 An additional area of land was surveyed in August 2021 in order inform the placement of Turbine 6 (T6). The Phase 1 Habitat Survey and the NVC survey (and subsequent GWDTE assessment) were also undertaken by PlantEcol (see Technical **Appendix 11.A**).

Protected species

Badger

11.32 The need for targeted surveys for badger (*Meles meles)* was scoped out of the assessment, on the basis of the absence of records (from both the desk study and during previous survey completed for the Operational Scheme) and due to the sub-

optimal nature of habitats present to support these species. However, any evidence of the species that was recorded during surveys for other species and during the habitat surveys, was recorded and the location mapped.

11.33 Results for badger are presented within Technical **Appendix 11.C**.

Otter

11.34 Surveyors searched for and recorded signs of otter (*Lutra lutra*) use in watercourses, water bodies and drainage ditches across the site in accordance with standard survey guidance (Chanin, 2003). Survey included a walkover of all the watercourses which fall within the Proposed Development to assess their suitability for supporting otter (Chanin, 2003). Burns, pools and wet flushes within 200 m of proposed turbine locations and infrastructure were searched for evidence of otter presence in line with NatureScot guidance (https://www.nature.scot/doc/standing-advice-planning-consultations-otters) which states that otter survey should be completed of all suitable habitats within 200 m of development proposals.

11.35 Survey was aided by the placement of PIR sensor activated wildlife trail cameras[3] on two of the larger watercourses between 21 July 2020 and 4 August 2020; and between 28 April 2021 and 09 May 2021. A camera was placed on the Allt Carn an t-Sean-liathanaich at approximate OSGR NH 87527 34592, close to where an existing track crosses the watercourse in the eastern of the Proposed Development. A second camera was placed on the Allt Seileach at approximate OSGR NH 85750 33627.

11.36 Otter surveys were undertaken by BSG Ecology on 21 July 2020 and 28 April 2021 (see Technical **Appendix 11.C**)

Water vole

11.37 Water vole (*Arvicola amphibious*) survey methods were based on the standard water vole survey described by Dean *et al*. (2016). The banks of each watercourse, water body and drainage ditch within 200 m of proposed turbine locations and infrastructure were surveyed were surveyed. Signs of water vole activity, such as burrows, runways through vegetation, piles of feeding remains and faecal latrines, were noted.

11.38 Information on habitat suitability for water vole was also collected for each watercourse within the survey area in accordance with Harris *et al.,* (2009). This method assesses eight habitat characteristics, each scoring 1 if present and 0 if absent. These scores are then applied to habitat categories of: >5 "optimal", 3-5 "sub-optimal" or <3 "unsuitable".

11.39 Water vole surveys and habitat assessment were undertaken by BSG Ecology on the 21 July 2020 and 28 April 2021 (see Technical **Appendix 11.C**)

Pine marten

11.40 Pine martens *Martes martes* are mainly found in woodlands, including conifer plantations although they may also venture into more open country to hunt, including rocky hillsides (Cresswell *et al*., 2012). The survey area for pine marten was therefore

[3] The trail cameras used a passive infrared (PIR) sensor that activated the camera whenever motion was sensed within its monitoring range.

focused on areas within the western part of the Proposed Development and close to plantation woodland habitat provided by Glenkirk Forest, which will provide the most suitable potential pine marten habitat.

11.41 If any potential evidence of pine marten presence was found its location would have been recorded and any potential pine marten scats would have been collected for DNA analysis (none were found). These surveys were complemented by two PIR sensor activated wildlife trail cameras that were placed in the western part of the Proposed Development.

11.42 Pine marten surveys were undertaken by BSG Ecology on 21 July 2020 and 28 April 2021 (see Technical **Appendix 11.C**)

Wildcat

11.43 NatureScot advocates a risk-based habitat survey approach and a walkover survey looking for potential den sites and other signs of Scottish wildcat *Felis sylvestris* presence (SNH, 2014) and this approach was applied to survey of the Proposed Development. This was done as part of a walkover of the site looking for potential den sites and other signs of wildcat presence. Survey was focused on habitats in the western part of the Proposed Development and close to Glenkirk Forest (habitat more suited for supporting the species than the open moor habitat that dominates elsewhere within the Proposed Development.)

11.44 Wildcat survey was completed by BSG Ecology on 21 July 2020 and 28 April 2021 BSG Ecology (see Technical **Appendix 11.C**).

Bats

11.45 An assessment of the suitability of habitats to support roosting, foraging and commuting bats was carried out based on the results of the Phase 1 Habitat Survey. This information was used to identify and evaluate potential bat roost sites and to inform the level of survey effort (fixed point detector surveys) in accordance with SNH *et al*. (2019).

11.46 Bat surveys completed for the previously consented Operational Scheme included a combination of walked transects and fixed-point detector surveys. Since these surveys were completed, new guidance has been published and this favours the use of fixed-point detector surveys without the need to undertake walked transects. The use of fixed-point detector surveys alone for the Proposed Development was presented in the Scoping Report that was submitted prior to EIA being undertaken.

11.47 Bat survey of the site was carried out in line with current industry guidance (SNH *et al*., 2019) which recommends that static detectors should be placed to collect a representative sample of bat activity at or close to the proposed turbine locations. Static detectors were therefore placed at each of the turbine locations (ten locations at the time of survey commission).

11.48 Detectors were deployed for a minimum of ten consecutive nights of data collection at each location. Survey work has been undertaken in July 2020 (Survey Period 1 - summer), September 2020 (Survey Period 2 - autumn), and May 2021 (Survey Period 3 - spring).

11.49 Bat surveys were carried out by BSG Ecology (see Technical **Appendix 11.B**).

Fish and fish habitats

11.50 Fish surveys were undertaken on watercourses that were assessed as potentially being suitable for fish production (specifically salmon (*Salmo salar*), sea trout (*Salmo trutta*) and lampreys), by an experienced fish biologist with Scottish Fisheries Co-ordination Centre (SFCC) habitat survey qualifications. Methods were based on protocols described by Summers *et al*., (1996) and SEPA (2010).

11.51 Surveys were completed of the Allt Carn an t-Sean-liathanaich, Allt an t-Slugain Mhoir, Caochan Tom na Clach, Allt Seileach and minor tributaries of Allt Carn an t-Sean-liathanaich.

11.52 In-stream habitats were characterised along contiguous 200 – 300m sections of river habitat according to depth, substrate, flow and suitability for different age classes of salmonid. The following variables were recorded in addition to the section location:

- The presence of suitable cover for salmonids
- Barriers to migration and permeability of obstacles for adult fish
- Wet width
- Substrate stability and compaction
- Availability of cover for fish alongside banks.

11.53 Spot checks for lamprey were also carried out where suitab;e lamprey habitat was present such as fine sand and silt (Maitland, 2003).

11.54 Fish populations at suitable locations representative of the available habitats were surveyed by electric fishing (electrofishing) according to SFCC protocols (2014). These surveys included quantitative surveys of fish abundance and semi-quantitative surveys where fully quantitative surveys were not practical.

11.55 Fish surveys were undertaken by Waterside Ecology (see Technical **Appendix 11.D**).

Other species

11.56 Records were made of any other species included on the Scottish Biodiversity List that were observed during walkover surveys or where field signs indicative of presence were noted.

11.57 Incidental observations of deer and their field signs were made during the completion of surveys.

EIA Assessment Process

11.58 The evaluation and assessment within this chapter has been undertaken with reference to the current guidelines for Ecological Impact Assessment published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018). Although this is recognised as the industry standard for ecological assessment, the guidance is not prescriptive; rather, it aims to "provide guidance to practitioners for refining their own methodologies".

Important Ecological Features

11.59 A first step in Ecological Impact Assessment (EcIA) is determination of which ecological features (habitats, species, ecosystems and their functions/processes) are important. Important ecological features should then be subject to detailed assessment if they are likely to be affected by a proposed development. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to effects of the proposal, such that there is no risk to their viability.

11.60 Ecological features can be important for a variety of reasons and the rationale used to identify these is explained below. Importance may relate, for example, to the quality or extent of designated sites or habitats, to habitat/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline.

Evaluation: Determining Importance

11.61 The importance of an ecological feature is considered within a defined geographical context. The following frame of reference has been used in this case:

- International and European;
- National (UK);
- National (Scotland);
- Regional (Scottish Highlands);
- County (Inverness);
- Local (Area between villages of Tomatin, Carnoch, Carrbridge and immediate surrounds); and
- Site (and immediate surrounds).

11.62 In certain circumstances particular receptors may be valued below the Site level. In these instances they are described as being of Negligible importance.

Characterising and Quantifying Effects and Assessing their Significance

11.63 The CIEEM (2018) guidelines state that ecological effects or impacts should be characterised in terms of ecosystem structure and function and reference should be made *where relevant* [author's emphasis] to: beneficial, adverse or neutral effects; extent; magnitude; duration; reversibility; timing and frequency; and cumulative effects. The guidelines provide a list of "*aspects of ecological structure and function to consider when predicting impacts and effects*". The terms impact and effect are used within this chapter in accordance with the following definitions (as provided by the guidelines):

- Impact: Actions resulting in changes to an ecological feature. For example, the construction activities of a development removing trees.
- Effect: Outcome to an ecological feature from an impact. For example, the effects on a bird population from loss of trees.

11.64 Following the characterisation of effects, an assessment of the ecological significance of those effects is made. The guidelines promote a transparent approach in which a

beneficial or adverse effect is determined to be significant or not, in ecological terms, in relation to the integrity of the defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, which relates to the level at which it has been valued. The decision about whether an effect is significant or not, is independent of the value of the ecological feature; the value of any feature that will be significantly affected is then used to determine the implications, in terms of legislation and / or policy.

11.65 Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of this assessment, 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features'. A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. The EcIA guidelines state that "*A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant adverse ecological effects can be lawfully permitted following EIA procedures*".

11.66 Industry-standard CIEEM guidelines encourage the expression of significance of ecological effects with reference to a geographic frame of reference, as described above. However, other disciplines within this EIA Report use criteria based on an expression of severity of significance to describe the significance of environmental effects. Table 11.1 provides a means of relating the two approaches and is provided to allow the ecological impact assessment to be integrated into the wider EIA without compromising the CIEEM approach.

Table 11.1: Relationship between EcIA and EIA assessments of significance.

Significant effect	CIEEM criteria
Major	Residual ecological effects assessed as being significant at the Regional scale or above and that have triggered a response in development control terms will be considered to represent effects that overall within the ES are of major significance.
Moderate	Residual ecological effects assessed as being significant at the County scale and that have triggered a response in development control terms will be considered to represent effects that overall within the ES are of moderate significance.
Minor	Residual ecological effects that have been assessed as being significant at the Site to Local scale and are unlikely to trigger a response in development control terms will be considered to represent effects that overall within the ES are of minor significance.

Negligible	Residual ecological effects that are considered to be not significant at any geographical level and are unlikely to trigger a response in development control terms will be considered to represent effects that overall within the ES are of no / negligible significance.

Baseline Conditions and Evaluation

11.67 This section sets out the findings of the consultation, baseline ecological survey work and desk study. It then goes on to assess the interest of the identified ecological resources. Ecological receptors are considered in the following order:

- Protected sites – both statutory (e.g., Sites of Special Scientific Interest) and non-statutory (e.g., Sites of Importance for Nature Conservation);
- Habitats;
- Species.

11.68 Several species and habitats have been scoped out of the assessment on the basis that they are either: unlikely to be present; unlikely to be significantly affected by virtue of the design or operation of the development; or because they are very commonplace and/or of very low conservation value (unless there are other reasons to consider them further, for example, they may be legally protected or require special care and therefore require particular precautionary measures to be adopted).

11.69 Where it has been possible to scope out a particular ecological feature, the rationale for doing so is provided in the text below.

Statutory Designated Sites

11.70 Four statutory designated sites were identified within 5 km of the Proposed Development. These include Carn nan Tri-tighearnan Special Area of Conservation (SAC) a site of international conservation importance, and three sites of National importance: Carn nan Tri-tighearnan Sites of Special Scientific Interest (SSSI), Findhorn Terraces SSSI, and Allt a' Choire SSSI. All four sites are designated for the upland habitats, fluvial geomorphology and quaternary geology that they support. These sites are listed in Table 11.2 together with details of their interest features (species and habitats) and proximity to the Proposed Development. Their positions in relation to the Proposed Development are shown on **Figure 11.1**.

Table 11.2: Statutorily designated sites within 5 km of the Proposed Development

Site name	Reasons for designation	Location of nearest section of site	Contextual comments
Carn nan Tri-tighearnan SAC	Blanket bog habitats	c.2.4 km north-west	Separated from the Proposed Development site by the River Findhorn and therefore not

Site name	Reasons for designation	Location of nearest section of site	Contextual comments
			likely to be hydrologically connected to it.
Carn nan Tri-tighearnan SSSI	Blanket bog and subalpine dry heath habitats	c.2.4 km north-west	Separated from the Proposed Development site by the River Findhorn and therefore not likely to be hydrologically connected to it.
Findhorn Terraces SSSI	Fluvial geomorphology interest	c.2.2 km north-west	No cited ecological interest.
Allt a' Choire SSSI	Geological interest	c.1.3 km north	No cited ecological interest.

11.71 Impacts on statutory designated sites are not anticipated as a result of the proposals. The SAC and SSSIs detailed in Table 11.2 are designated for geological, fluvial geomorphology and upland habitat interests and will not be subject to land take from the scheme. The nearest part of the SAC is c.2.4 km to the north-west of the Proposed Development site, and it is separated from the site by the River Findhorn. Impacts on the SAC and all the other designated sites listed in Table 11.2, are very unlikely and consequently all of them have been scoped out of further assessment. This is consistent with the comments received from NatureScot within their Scoping Opinion response dated 14 May 2021.

Habitats

11.72 Technical **Appendix 11.A** contains the detailed results of the habitat surveys undertaken. **Figure 11.2** shows the Phase 1 habitats within the Proposed Development whilst **Figure 11.3** shows the location of the NVC communities that are potentially groundwater dependent. **Figures 4** to **14** contained within Technical **Appendix 11.A** show the distribution of the NVC communities present. The following sections provide a summary of the findings of the habitat survey.

11.73 The Proposed Development covers an area of approximately 300 ha. In addition to this the existing access track which leads to the Operational Scheme from the B9007 to the east, measures approximately 11.5 km in length and comprises a hard-standing track approximately 5 m wide (some localised bends are wider). Habitats adjacent to either side of the existing access track are dominated by blanket bog; watercourses cross under the track in a small number of locations. As no works are proposed to the access track other than routine repair and maintenance (see **Chapter 3: Description of the Proposed Development**), this area was not subject to detailed habitat survey.

11.74 The Proposed Development site encompasses the south-eastern part of the Operational Scheme and includes existing access tracks, substation, construction area

and a single borrow pit, previously used for the Operational Scheme (see **Chapter 3: Description of the Proposed Development**). Habitats within the Proposed Development include modified blanket bog with smaller areas of wet heath, dry heath, acid flush and acid grassland. A few scattered shrubs occur within the site but there are no trees or areas of woodland.

11.75 A total of 15 different plant communities were found that matched NVC descriptions and within these a total of 12 sub-communities were recognized. None of the plant communities or sub-communities are rare at the national level.

Blanket bog

11.76 Heather *Calluna vulgaris* - hare's-tail cotton-grass *Eriophorum vaginatum* blanket mire (19) occurs extensively within the Proposed Development site. Most of this community had a high abundance of the reindeer lichens *Cladonia arbuscula* and *C. uncialis*. The stands of this vegetation type are best placed in the cowberry *Vaccinium vitis-idaea* – glittering wood-moss *Hylocomium splendens* sub-community (M19c) and possibly the crowberry *Empetrum nigrum nigrum* variant as described in Rodwell *et al*., (1992a).

11.77 The remaining areas of the M19 vegetation are not easily placed in either the cross-leaved heath *Empetrum nigrum* or crowberry sub-communities (M19a and M19b, respectively). This is because the preferential species for these two sub-communities were not always consistently present, especially cross-leaved heath, crowberry or deer-grass *Trichophorum germanicum*. Some of the stands of this vegetation were on shallow peat, i.e., less than 50 cm deep, and were therefore classified as wet heathland rather than blanket bog, even though the species composition was indicative of blanket bog habitat.

11.78 Blanket bog, being rain fed, is generally not considered a GWDTE. The NVC communities of M19 are considered by SEPA as being at low risk of being groundwater dependent (SEPA, 2017).

11.79 Under the EU Habitats Directive blanket bog is an Annex 1 priority habitat but only when 'active'. Priority Annex 1 habitats are considered to be either highly vulnerable and/or exclusively found in the European Union.

11.80 'Active' blanket bog is defined by Lindsay *et al* (2014) as supporting a significant area of vegetation that is normally peat-forming. Typical species include the important peat-forming species, such as bog-mosses *Sphagnum* spp. and cotton grasses *Eriophorum* spp., or purple moor-grass *Molinia caerulea* in certain circumstances, together with heather and other ericaceous species. Thus sites, particularly those at higher altitude, characterised by extensive erosion features, may still be classed as 'active' if they otherwise support extensive areas of typical bog vegetation, and especially if the erosion gullies show signs of recolonization.

11.81 Blanket bog is included as a priority habitat on the Scottish Biodiversity List. Scotland has a significant share of the world's peatlands, of which blanket bog is the dominant habitat type and the requirement to protect and restore them has resulted in the production of Scotland's National Peatland Plan (2015).

11.82 Much of the area of blanket bog on the site is not in good condition. The combination of moor drains, erosion, muirburn[4] and sheep grazing has resulted in this habitat being significantly modified, including the extensive drying of the peat. There are no areas of intact active blanket bog vegetation present within the survey area.

11.83 Although natural erosion of blanket bog and formation of gullies in stream heads in particular, can occur on healthy blanket bog, the extent of gully formation and peat erosion on the slopes of Tom nan Clach is high and bare peat is common. Bog mosses *Sphagnum* spp., the main peat building species, are lacking or present at low frequency within much of the blanket bog on site. Bog pools, which would normally be colonised by a range of bog mosses and cotton grass, are frequently unvegetated. There are commonly occurring carpets of lichens which have formed on otherwise sparsely vegetated peat. Although lichen-rich blanket bog is a feature of this part of Scotland, lichens also appear to be common on degraded oxidised peat at this site and cannot be used as an indicator of blanket bog quality.

11.84 Climate change and historical management are likely to have contributed to the degradation of bog habitats on site. Drainage of the bog has occurred and evidence of burning is also prevalent. Grazing by sheep is also likely to have contributed to the degradation. Historically, however, active peat formation only occurs when climatic conditions are favourable and it is possible that current climatic trends may impact adversely on peat growth. In this scenario therefore, the impacts of land management are likely to be exacerbated.

11.85 Although few signs of recolonization of erosion gullies were evident, for the purposes of the EIA a precautionary approach has been taken which considers the blanket bog within the Proposed Development as a complex mosaic of active and degraded areas.

11.86 The blanket bog on site does not reach the standard for SAC selection. For example, the nearby Carn Nan Tri-trighearnon SAC is described as having a relatively continuous carpet of *Sphagnum*, which is not the case at the Proposed Development. It does, however, qualify as a priority habitat as defined on the Scottish Biodiversity List and the habitat is a national priority as highlighted in Scotland's National Peatland Plan (NatureScot, 2015). Although blanket bog covers a significant proportion of the Proposed Development, it is located within a part of Scotland where blanket bog is relatively common: this habitat is widespread in the Scottish Highlands and areas surrounding Inverness. Taking into consideration the amount of blanket bog present within this geographic context, and the degraded condition of the habitat within the site, the resource is not considered to be important at the Regional level. However, the extent of blanket bog does suggest that an evaluation of **important at the County level** would be appropriate.

Dry Heath

11.87 The next most widespread plant community is the heather - blaeberry *Vaccinium myrtillus* heath (H12), which covers less than 10% of the ground within the Proposed Development. This community is represented by the heather sub-community (H12a),

[4] Muirburn is the intentional burning of moorland to remove the top layer of vegetation.

which has a high cover of heather (Rodwell *et al*., 1992b). It is most abundant on the slopes of the various valleys within the survey area.

11.88 A small area of heather – wavy hair-grass *Deschampsia flexuosa* heath (H9) is in an area where evidence of recent burning was noted around the areas of bare peat to the east of the proposed construction compound.

11.89 Heather - blaeberry - bog-moss *Sphagnum capillifolium* heath (H21) was found on north- to east-facing slopes of the stream valleys and is limited in extent. This community is of the less species-rich sub-community heather – bracken *Pteridium aquilinum* sub-community (H21a).

11.90 The blaeberry – cloudberry *Rubus chamaemorus* heath (H22) was found on north to north-west facing slopes at the western side of the Proposed Development. This is typically a community of moderate to high altitudes on slopes with significant accumulation of snow in the Grampian mountains (Rodwell *et al*., 1992). The community here is probably represented by the hair-cap moss *Polytrichum commune* – heath bedstraw *Galium saxatile* sub-community (H22a). This habitat occurs over 160 m from any proposed infrastructure and turbines.

11.91 Both the heather – reindeer lichen *Cladonia arbuscula* heath (H13) and heather – bearberry *Vaccinium uva-ursi heath* (H16) were found on the summits of small hillocks on the higher ground towards the west of the Proposed Development where the lack of snow-cover in winter probably favours these two communities.

11.92 None of these dry heath communities are considered to be groundwater dependent.

11.93 All of the dry heath communities recorded on site are Annex 1 habitats as listed within the EU Habitat Directive. Communities H9, H12, H16 and H21 are included within the European dry heath category, and communities H13 and H22 fall within the Alpine and Boreal heath category. All are priority habitats and are included on the Scottish Biodiversity List as Upland Heathland.

11.94 Within the Proposed Development the dry heath communities are highly restricted in extent and do not qualify for SAC selection, the purpose of which is to identify the most extensive high-quality heaths. The overall evaluation of the site for dry heath takes into account the small extent and patchy occurrence of the habitat within the Proposed Development and the degraded condition of the majority of dry heath on the site.

11.95 Dry heath is a common and extensive habitat in the north-east of Scotland; upland heaths are estimated to cover 21-31% of land area in Scotland (https://www.nature.scot/landscapes-and-habitats/habitat-types/mountains-heaths-and-bogs/heath). Although this habitat is a priority habitat in the Highland Biodiversity Action Plan, the dry heath on site is limited in extent and therefore does not contribute extensively to the Highland resource as a whole. There are, however, small amounts of some rarer dry heath communities: H13 and H21a communities are ecologically diverse and have more restricted distributions in the UK. The community H16, which is present in a degraded condition on site, has a very restricted distribution in Scotland. This community is present in only very small amounts within the Proposed

Development and represents a small percentage of the total heathland habitat; none falls within 100 m of any proposed infrastructure.

11.96 These scarcer heath communities are very limited in their extent within the site, however, and are in poor condition. As no impacts are expected on dry heath communities H13, H21a and H16 due to their distance from the areas that will be developed, they are scoped out and not considered further in this assessment.

11.97 The remaining dry heath habitats within the Proposed Development comprise common and widespread communities. These habitats have been evaluated as being of **Local level importance.**

Acid Flush

11.98 Acid flush communities are the most common wetland community on the site and are strongly associated with waterbody features such as springs, burns, and drains but can spread out into depressed basins along these features. The areas of star sedge *Carex echinata* – bog-moss *Sphagnum recurvum/S. auriculatum* mire are dominated by soft rush and consequently best placed in the M6c sub-community. This plant community is common throughout upland Britain where acidic ground-waters seep out from blanket bog and heathland habitats.

11.99 In some places the acid flushes have relatively extensive carpets of *Sphagnum fallax* where soft rush is totally absent. These areas are better matched to the feathery/flat-topped *S. cuspidatum/S. fallax* bog-moss bog pool (M2) community. This community is present in some of the bog pools that have more stable water-levels, but the community is particularly widespread in the area immediately to the east of the Glenkirk Forest and over 400 m from any of the nearest Proposed Development infrastructure. The M2 community and area of blanket bog to the east of Glenkirk Forest is significantly wetter than areas of blanket bog elsewhere within the Proposed Development.

11.100 M6 communities identified by the NVC survey are considered to be potentially highly groundwater dependent depending on the hydrogeological regime (SEPA, 2017). The Proposed Development site is located towards the top of the catchment or recharge zone and is underlain by relatively impermeable bedrock with relatively impermeable glacial till and peat deposits above. These geological conditions are unlikely to produce significant groundwater flow and therefore are unlikely to support GWDTE.

11.101 The majority of acid flush vegetation on the site is associated with running water features, and therefore it is likely to be more dependent on surface water rather than groundwater. Acid flushes at the top of the catchment will be dependent on rainwater and surface water, whereas some acid flushes associated with depressions or springs lower down in the catchment may have some minor localised shallow groundwater influence.

11.102 Based on this, the only potential GWDTE that may have some minor groundwater dependency is the potential GWDTE immediately downgradient (north) of T1 crane pad area (see **Figure 11.3**), although this is still likely to be dominated by surface water runoff.

11.103 Acid flushes are included on the Scottish Biodiversity List. The M6c vegetation community is a common and widespread community in the uplands and the acid flush habitats are localised in their distribution and are not particularly species rich. The acid flush habitat is therefore assessed as being of **Local level importance.**

Acid Grassland

11.104 Small areas of acid grassland are present within the Proposed Development, restricted to better drained soils within the stream valleys and associated with the burns and acid flush communities. The sheep's fescue *Festuca ovina* - common bent *Agrostis capillaris* - heath bedstraw (U4) and mat-grass *Nardus stricta* - heath bedstraw (U5) grassland communities are common types of acid grassland community found in the uplands of Britain. Acid grasslands are not considered to be groundwater dependent.

11.105 Acid grassland on the Site is species-poor and commonly occurring within the uplands of Scotland. Taking this, and the limited extent of the habitat within the Proposed Development, into consideration the acid grassland is evaluated as being of **Site level importance**.

Juniper scrub

11.106 A small area of juniper scrub (W19) is present in the valley which forms the headwaters of the Allt Seileach. This was the only stand of juniper that was recorded and, although individual juniper bushes were found occasionally within the Proposed Development, typically on the slopes of the stream valleys, none were identified within 150 m of any of the proposed infrastructure. As the main stands of juniper are located outside the Proposed Development site boundary, and as only very occasional shrubs are present within the site boundary, no impacts are expected and the species is scoped out and not considered further in this assessment.

Watercourses

11.107 The site is drained largely by the headwaters of Rhilean Burn, including the following named watercourses: Allt Carn an t-Sean-liathanaich (the upper reach of the main stem of Rhilean Burn), Allt an t-Slugain Mhoir and Caochan Tom nan Clach. The entire site lies within the catchment of the River Findhorn.

11.108 Allt Carn an t-Sean-liathanaich has a wet width ranging from 2 to 5 m. The lower reaches included sections with some bank erosion; however, more stable banks are present upstream. Substrates are dominated by cobble and boulder and the flow types are mainly run, riffle and glide.

11.109 Some sections of the Allt an t-Slugain Mhoir were deep and characterised by deep glide or deep pool, linked by runs. In these sections boulder, cobble and pebble substrate was scarce. Elsewhere a mix of cobble, pebble and sand substrates is present. Wet width ranged from 1 to 2 m.

11.110 The Caochan Tom nan Clach has a wet width that is typically between 0.5 and 1.2 m. The stream flows between steep v-shaped banks and is quite steep with a step-pool channel form. Substrates are mainly of cobble, pebble and boulder.

11.111 The watercourses within the Proposed Development site generally have a mixed substrate and good water quality with some localised evidence of erosion. Similar upland headwater streams are likely to be widespread in the area and therefore this habitat is evaluated as being of **Site level importance** (the importance of the watercourses for fish is considered below).

11.112 As impacts on watercourses have been minimised through design (avoiding the need to cross watercourses where possible) and through the adoption of relevant guidance (see Designed-in Avoidance, Mitigation, Compensation and Enhancement Measures section below), this habitat has been scoped out of the assessment. Watercourses are considered, however, with reference to the assessment of effects on fish.

Species

Badger

11.113 No records of badger were identified during the desk study and no previous badger evidence was recorded within the Proposed Development site in 2014.

11.114 No evidence of badger was recorded during any of the survey visits completed in 2020 and 2021. The upland habitats that dominate within the Proposed Development are poorly suited to badger, lacking good foraging resources or opportunities for sett creation. Glenkirk Forest is the nearest habitat with good potential for supporting badger and is located over 500 m from the nearest proposed turbine or infrastructure location. It is therefore considered unlikely that badger is present within the site. Overall, the Proposed Development site is assessed as being of **negligible importance** to badger and the species is scoped out from any further assessment.

Otter

11.115 Four records of otter were returned by HBRG from within the 2 km search radius. Of these records only one was dated post 1980 and this originated from within Glenkirk Forest to the west of the Proposed Development.

11.116 Survey of the watercourses within the Proposed Development found that the majority were poorly suited to otter given their size and the poor foraging resources that they would provide. The surrounding open moorland habitat that dominates within the site also lacks opportunities for shelter.

11.117 A single otter spraint was identified on a rock along the Allt Carn an t-Sean-liathanaich approximately 125 m from the nearest proposed watercourse crossing. No other evidence of otter was recorded during the surveys of the Proposed Development, and neither were any sightings recorded on any of the wildlife cameras. The location of the spraint is shown on **Figure 11.4**.

11.118 Whilst it is likely that the Allt Carn an t-Sean-liathanaich and connecting lower reaches of the Caochan Tom nan Clach may provide some potential habitat for otter, the survey findings suggest that use is likely to be limited to foraging and commuting only, and this is only likely to be on an infrequent basis. Based on this, the Proposed Development Site is assessed as being of **Site level importance** for otter.

Water vole

11.119 The desk study identified two records of water vole, both dating from pre-1990 and identified to a two figure OSGR only (records returned by HBRG).

11.120 The 2014 survey work recorded water vole signs along the upper section of the Allt Carn an t-Sean-liathanalch, and along the upper section of the Caochan Tom nan Clach burn, both sections of which fall within the Proposed Development.

11.121 Habitat suitability assessment indicates that sections of the Allt Carn an t-Sean-liathanalch are suitable for supporting water vole particularly where slow flowing, meandering, sections of watercourse are associated with wetland and grassland habitat. Whilst the lower reaches of Caochan Tom nan Clach Water are also considered to be suitable for supporting water vole, none fall within 200 m of the proposed turbine or infrastructure locations.

11.122 The reaches of the remaining watercourses that fall within 200 m of proposed turbine and infrastructure locations, are all considered to be sub-optimal and unsuitable for water vole. This is due to the presence of bare peat which forms the banks, the very narrow, shallow characteristics of the channels and the disturbance and poaching that has arisen from land management practices. These characteristics mean that sufficient food, burrow forming and refuge opportunities are lacking.

11.123 No evidence of water vole was identified during either the 2020 or 2021 survey, despite a detailed search of the upper sections of the Allt Carn an t-Sean Liathanalch. It is possible that the species has become more restricted in its distribution or suffered a reduction in population numbers since survey in 2014 resulting in the negative survey result from 2020/21.

11.124 Overall, based on the suitability of the habitats present and the results of the survey, the Proposed Development site is assessed as being of **Negligible importance** to water vole and this species is scoped out of further assessment. As a precaution, however, given the historical records from within the site and the legal protection afforded to water vole, measures will be included within the CEMP to mitigate impacts on water vole. These are detailed within the mitigation section below.

Pine marten

11.125 No records of pine marten were returned by HBRG during the desk study.

11.126 During the surveys carried out in 2014 fresh prints that were considered to have been made by a pine marten, were found in wet peat approximately 500 m to the south-west of the Proposed Development, in close proximity to Glenkirk Forest. No other field signs were recorded at that time.

11.127 No evidence of pine marten was recorded during the 2020/21 survey. Habitats within the Proposed Development are dominated by open moorland with only very small, isolated areas of scrub and very few features that could be used as dens or shelters. Consequently, habitats are poorly suited to pine marten and they are considered unlikely to be present. The Proposed Development site is considered to be of **negligible importance** to pine marten and the species is scoped out from any further assessment.

Bats

11.128 No potential roost sites (either buildings, structures or trees) are located within 500 m of any of the proposed turbine locations.

11.129 The desk study identified eight bat records within 2 km of the site (returned by HBRG). These included five records of Daubenton's bat *Myotis daubentonii*, one of Natterer's bat *Myotis nattereri* and two records identified only as 'bat'. None of the records are from the last ten years.

11.130 Bat survey found that activity within the site was limited to two genus of bat, *Pipistrellus* sp. and *Myotis* sp. Most of the recorded bat activity was attributed to common pipistrelle *Pipistrellus pipistrellus* which accounted for 74% of all bat activity recorded within the Proposed Development site. *Myotis* sp. was the second most frequently recorded bat with a total of 20% of all bat activity attributed to this species. *Myotis* sp. was also the only bat to be recorded during all three survey periods. Soprano pipistrelle *Pipistrellus pygmaeus* activity accounted for 7% of all recorded bat activity.

11.131 Overall, bat activity within the site was very low, with a total of 269 bat passes recorded over 41 survey nights from all detector locations. The highest number of bat passes was recorded at Location 5 during Survey Period 2 (September): a total of 50 bat passes was recorded (an average of 3.8 bat passes per night). Location 5 falls outside of the Proposed Development site boundary since the number of proposed turbines was reduced from 10 to 7. The highest activity within the site boundary was at location 8 where 48 passes was recorded in Survey Period 2 (September).

11.132 Bat activity was higher during Survey Period 2 (September) when a total of 249 bat passes was recorded. In comparison, 17 bat passes were recorded in Survey Period 1 (July/August) and just 3 bat passes were recorded in Survey Period 3 (April/May 2021). During each Survey Period there were multiple nights where no bat activity was recorded at all. Table 11.3 shows the average number of bat passes recorded per night at each location during each monitoring period.

Table 11.3: Average number of bat passes recorded per night at each static bat detector survey location.

Location	1	2	3	4	5	6	7	8	9	10
Survey Period 1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.3	0.1	0.3
Survey Period 2	0.0	0.8	1.1	2.0	3.8	1.9	0.0	3.7	2.2	3.5
Survey Period 3	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0

11.133 These results indicate that, whilst bats are present within the Proposed Development site, activity was very low and involved only a small number of species. Based on the low suitability of the habitats within the site, the lack of roosting opportunities, and the low level of activity recorded, the Proposed Development is assessed as being of **Site level importance** for bats**.**

Wildcat

11.134 Two records of Scottish wildcat were identified during the desk study; one dated from 1913 and one from 1985 (returned by HBRG). Both were identified to a two figure OSGR only and consequently their origin could not be accurately located.

11.135 No evidence of Scottish wildcat was recorded during survey work in 2014.

11.136 No evidence of wildcat was recorded during the 2020 or 2021 survey. Wildcats will range into open moorland to hunt for prey, but generally will stay within 200 m of woodland cover (Silver, 2013). Woodland habitat is located approximately 450 m from the nearest turbine location. Consequently, the habitats within the Proposed Development are considered to be poorly suited for supporting this species and wildcat is considered unlikely to be present.

11.137 The Proposed Development is considered to be of **negligible importance** to wildcat and the species is scoped out from any further assessment.

Fish and fish habitats

11.138 The Proposed Development is drained largely by the headwaters of the Rhilean Burn. A small proportion of the western part of the site is drained by the headwaters of Allt Seileach. Survey during 2014 found that the reaches of Rhilean Burn and Allt Seileach within the Proposed Development are inaccessible to migratory salmonids (due to the presence of a high >5 m waterfall near the confluence of the Rhilean Burn with the River Findhorn).

11.139 Survey findings in 2020 are consistent with 2014 and suggest that resident (non-migratory) brown trout are the only fish species present within the Proposed Development. Brown trout (including sea trout) is listed as a priority species on the Scottish Biodiversity List.

11.140 The largest areas of suitable trout habitat are along the Allt Carn an t-Sean-liathanaich, which also provides the best quality rearing habitats for this species. Electric fishing survey found trout fry densities in the stream were generally poor and were lower than parr densities. The majority of parr were aged 1+ and this cohort was relatively strong. The age profile suggests that recruitment in 2020 was rather poor, but that it may be expected to vary substantially year-to-year.

11.141 Good numbers of trout parr were recorded in the lower reaches of Caochan Tom nan Clach; fry were outnumbered by older year classes, mainly 1+ parr. This stream is moderately productive for trout and little suitable spawning habitat was found to be present. The better quality habitat was found to be restricted to the lower 300 m of the stream so the total productive area is likely to be less than 300 m^2 due to the stream's small size.

11.142 Trout was widespread in most other watercourses within the Proposed Development, albeit in low densities at some locations. Densities of trout fry were generally low, but parr densities were mainly fair to excellent by regional standards. This may suggest that there is substantial, natural year-to-year variation in trout recruitment.

11.143 Based on the suitability of the habitats and the findings of the electric fishing surveys (discussed in more detail in Technical **Appendix 11.D**) the Proposed Development site is considered to be of **County level importance** for brown trout. The Proposed Development is considered to be of **negligible importance** for salmon and other fish species, which have been scoped out of the assessment as brown trout is the only species that is considered to be resident in watercourses within the site.

Other species

11.144 No evidence of non-native plants or animals was found during the surveys.

11.145 Red deer *Cervus elaphus* is a native species which has no natural predators and can cause damage to habitats if left uncontrolled. In certain circumstances large numbers of animals can harm sensitive habitats such as blanket bog by trampling and grazing.

11.146 No red deer sightings were made, or evidence found of red deer within the open moorland during the completion of habitat or protected species surveys. No evidence of trampling impacts was observed within the habitats on site. Trail cameras deployed in July 2020, within the vicinity of Glenkirk Forest, recorded red deer on a small number of occasions (**Appendix 11C**).

11.147 The Cawdor Estate reported that no red deer were resident within the estate and that few deer movements in general occur (Rachel Bromby, *personal communication*). They also reported that when deer did occur within the estate, numbers were strictly controlled.

11.148 Due to the low numbers of deer reported to be present, the absence of any evidence of deer damage, and the on-going control of red deer within the Cawdor Estate, it is not anticipated that deer displacement will occur as a result of the Proposed Development. It is therefore unlikely that nearby sensitive sites, such as the Carn Nan Tri-trigearnon SAC, will be impacted by displaced red deer. Red deer are therefore not considered further in the Assessment.

11.149 Fourteen records of mountain hare *Lepus timidus* were identified during the desk study, the majority of which are identified to a two-figure OSGR only. Mountain hares were frequently seen during surveys carried out in 2014 for the Operational Scheme and the species was recorded within the south-west of the Proposed Development on two occasions during the completion of surveys in 2021. The exposed moorland provides habitat that is suitable for mountain hare.

11.150 Mountain hare is included on the Scottish Biodiversity List and is included on Schedule 5 of the Wildlife & Countryside Act 1981 (as amended by the Wildlife and Natural Environment (Scotland) Act 2011). Mountain hare is known to benefit from habitats that are managed for grouse due to the muirburn practise, which means that young heather is available for food. The Proposed Development therefore has the potential to support a reasonable number of mountain hare but is located within a part of Scotland where similar habitats are common and widespread. The Proposed Development is therefore assessed as being of **Local level importance** for mountain hare.

Designed-in Avoidance, Mitigation, Compensation and Enhancement Measures

Scheme Layout Measures

11.151 As detailed in **Chapter 3: Description of the Proposed Development** there are a number of embedded design elements which would be implemented during the various stages of the development. In relation to ecology the measures described below, which will mitigate impacts on important ecological features, are inherent within the design.

11.152 The layout minimises the number of watercourse crossings as far as possible. Due to the presence of multiple minor unnamed tributaries throughout the south-eastern part of the Proposed Development, a small number of crossings are unavoidable in order to create the necessary infrastructure connections; however, as noted above, the number of watercourse crossings has been minimised and, where they are required, they will be located at a higher elevation within the catchment where the watercourses are at their narrowest. Only one crossing of a named or major watercourse is required: this is in the eastern part of the Proposed Development site where a crossing is required over the Allt Carn an t-Sean-liathanaich.

11.153 Two types of watercourse crossing are proposed for the Proposed Development: bridges and culverts. The use of each of these types of structure will be determined on a site-by-site basis. The crossing type will be chosen to minimise potential effects based on a site-specific assessment, which will account for topographic, hydrological and ecological attributes at each proposed crossing point.

11.154 The layout of the Proposed Development has been adjusted to avoid GWDTEs wherever possible or, where this is not possible, to restrict impacts to the edge of a groundwater dependent vegetation community so that the hydrological characteristics of the retained habitat can be maintained.

11.155 Where infrastructure has the potential to impact on a GWDTE, it will be designed to maintain the hydrological connectivity to the surrounding habitat, for example through the use of cross-drains, floating road construction techniques etc. Further details on design methods to mitigate potential impacts on GWDTEs are discussed in **Chapter 13: Hydrology, Hydrogeology, Geology and Peat**.

11.156 As described in **Chapter 3: Description of the Proposed Development**, a Peat Management Plan (PMP) will be produced following the completion of detailed ground investigations and infrastructure micro-siting and prior to construction commencing. The PMP will include detailed methods and specifications that will be agreed with SEPA and NatureScot.

11.157 Existing access tracks that form part of the Operational Scheme will be used to minimise habitat loss. The proposed alignment of new access tracks has been designed to avoid identified ecological constraints where possible (for example areas supporting more sensitive plant communities, such as acid flushes, and areas of higher potential for salmonid fish).

Construction Measures

11.158 The following are control measures that will be embedded in the design and planning of the construction phase of the proposed wind farm development.

General

11.159 In order to minimise the impacts of construction (e.g., disturbance arising from the works) all activity will be limited to clearly defined working areas, and the storage of surplus materials will be confined to areas of hard-standing. Vegetation clearance will be kept to a minimum and areas of hard-standing will be minimised to reduce the need for additional drainage provision.

11.160 An Ecological Clerk of Works (ECoW) will be appointed to ensure compliance with the Construction Environmental Management Plan (CEMP) as described in **Chapter 3: Description of the Proposed Development**, to provide advice in the event of any unforeseen protected species issues that arise during construction, and to oversee the implementation of mitigation measures.

11.161 The proposed mitigation and enhancement measures detailed below for habitats, European protected species (e.g., otter and bats) and other legally protected species (e.g., reptiles) would be incorporated into a Habitat Management Plan (HMP – **Appendix 11.E**), which would be prepared if the Proposed Development is granted planning permission.

11.162 Surface vegetation, peat and soil excavated when constructing the construction compounds, crane pads, turbine bases, access tracks etc. would be stored appropriately (i.e., separate topsoil, subsoil and peat storage areas) until required for reinstatement or translocation, post-construction.

11.163 Watercourses will be protected during the construction phase through the adoption of a range of mitigation measures which are outlined in **Chapter 3: Description of the Proposed Development** and which include the following:

- Avoidance of natural water features with a 50 m stand-off where possible;
- Drains, silt traps, check dams and barriers will be used to prevent silt-laden run-off from entering watercourses;
- Provision of temporary/permanent drainage routes will be adopted, including cross-drainage at access tracks in line with FCS/SNH guidance;
- Sensitive design of drainage ditches to avoid potentially silt-laden run-off flowing directly into natural channels, ephemeral burns or ditches;
- Floating roads will be employed where peat soils greater than 1.0 m depth are encountered and cannot be avoided by micro-siting;
- Best practice in accordance with SEPA's Guidance for Pollution Prevention (GPP) will be followed;
- It is proposed that the borrow pit used for the Operational Scheme will be re-opened: this is located away from water environment receptors in an area where rock is exposed or close to the ground surface;
- Watercourse crossings will be designed according to SEPA's position statement on the culverting of watercourses (SEPA, 2015), and with reference to SEPA and best practice guidelines (SEPA, 2010). Culverts and bridges will be designed to account for the topographic, hydrological and ecological constraints at each proposed crossing point with the exact design agreed with SEPA prior to construction;
- Sensitive location and containment of storage areas and stockpiles; and
- Refuelling will only take place on hard-standing.

11.164 The details of pollution prevention measures will be provided in a Construction Method Statement (CMS) which will include all construction elements, such as access tracks, electric cable laying, wind turbine foundations, crane pads, control building and temporary site construction compound.

11.165 Turbines will be micro-sited (+/- 50m) at the construction stage to avoid environmental or technical constraints including the avoidance of deepest areas of peat.

11.166 A suitable means of escape will be provided for animals from any exposed trenches and other deep excavations (such as a long wooden or metal plank). Deeper excavations (e.g., borrow pits) would be fenced off to prevent wildlife access if they are steep-sided and there is no other means of escape for trapped animals.

11.167 General controls on working hours during construction are detailed in **Chapter 3: Description of the Proposed Development**, most works would be undertaken during daylight hours. However, it may be necessary on occasion to undertake work at night or in the hours of darkness. Night working and the need for artificial lighting would be kept to a minimum and would be avoided altogether near watercourses in order to avoid effects on the feeding and commuting behaviour of species such as bats or otter.

Operational Measures

11.168 The following are control measures that will be embedded in the design and execution of the operational phase of the Proposed Development.

11.169 Relevant construction phase control measures will continue to be adopted during the operational phase where potential effects still exist. In particular, the potential for pollution or siltation incidents during routine maintenance activities would be minimised by adoption of best practice based on SEPA pollution prevention guidance. This will include the maintenance of ditches and silt traps to control run-off (further details are included in **Chapter 13: Hydrology, Hydrogeology, Geology and Peat**).

11.170 Permanent features of the proposed wind farm, which include wind turbines, crane pads and access tracks, are not predicted to have any continuing impacts on important ecological features once they have been constructed. The areas surrounding these permanent features would be reinstated as far as possible.

11.171 Site activities during the operational phase would be limited to monitoring and maintenance activities, with occasional minor excavations possible at the existing borrow pit for track maintenance. During these activities all working areas would be clearly defined and the storage of materials would be restricted to areas of hard-standing. Any maintenance works would take place during the day to minimise the potential for disturbance to protected species on site (e.g., otter and bats).

Decommissioning Measures

11.172 During the decommissioning of the Proposed Development, the potential effects on important ecological features are expected to be similar to those identified during the construction phase and thus similar mitigation measures are likely to be required. Any new legislation or guidelines published prior to decommissioning would be adhered to

and incorporated into the mitigation design prior to decommissioning taking place. Elements for considerations are likely to include:

- Destruction and/or disturbance of habitats that have developed during the operational life of the wind farm;
- Habitat restoration following the completion of decommissioning work;
- Protection of watercourses;
- Consideration of protected species, taking into account the potential for colonisation by species which were found to be absent during baseline surveys.

Assessment of Effects, Further Mitigation, Compensation and Enhancement

Blanket bog

Construction Phase Effects in the Absence of Mitigation

11.173 During the construction phase of the development the main impact on habitats will be through direct and permanent habitat loss within the development footprint. The construction of the turbine foundations, crane pads, access tracks and other infrastructure elements would result in the permanent loss of approximately 9.2 ha of blanket bog habitat. For habitats such as blanket bog, which rely on coherent internal hydrological systems, it is possible that indirect impacts may also occur because of interference with hydrological pathways. This could result in habitats drying or becoming wetter, either of which could result in changes to the vegetation community structure. The significance of such impacts is likely to be reduced by the fact that the peat habitats are already degraded as a result of drainage, management and grazing.

11.174 A 10 m working area has been assumed around all new tracks and infrastructure within which the habitats will potentially be subject to disturbance and damage. This is a precautionary area as damage is likely to be very localised depending on the nature of the work that is taking place.

11.175 In addition, there is potential for blanket bog to be affected by local changes to drainage. This may arise, for instance, by interference to flows through the peat resulting from the construction of tracks or infrastructure, or by an increase in local flows where outflows of drains occur. As well as water flow through the peat, changes in drainage may also affect the water table within the peat and subsequently the blanket bog vegetation community that forms on the surface.

11.176 The scale and magnitude of impacts may vary locally and are hard to predict with certainty. Because of this a precautionary approach has been taken and a 250 m buffer has been adopted around turbines and 100 m each side of new access tracks when assessing the potential extent of habitats that could be affected. These buffers are consistent with SEPA guidance (SEPA, 2017) for groundwater sensitive areas (and are referred to as 'SEPA buffer areas' hereafter). This is a precautionary buffer area and any change in hydrology is likely to be limited within this area (hydrological impacts are discussed in **Chapter 13: Hydrology, Hydrogeology, Geology and Peat**).

Table 11.4 – Summary of impacts to blanket bog (areas are approximate)

	Permanent loss of blanket bog (development footprint)	**Area of blanket bog with SEPA buffer areas**
Blanket bog	9.2 hectares	160.1 hectares
Wet modified blanket bog	-	0.04 hectares
Bare peat	0.04 hectares	3.97 hectares

11.177 Table 11.4 shows that the Proposed Development will result in the permanent loss of 9.2 ha of blanket bog. The total area of blanket bog within the Proposed Development is estimated between 265 and 296 ha (allowing for estimates of mosaics with other NVC communities, see **Appendix 11.A**).

11.178 The potential adverse impacts identified for bog habitat would include localised impacts, i.e., impacts that would be restricted to the development footprint and immediate area and potential localised changes in drainage. Permanent habitat loss or temporary damage would represent a small proportion of the total area of habitat within the Proposed Development and surrounding area and will have a minor impact on the integrity of the retained blanket bog. Losses through changes in drainage are less predictable and could impact a larger area. It is therefore considered that without mitigation, but taking into account the limited extent of the identified impacts, the Proposed Development would result in an adverse effect that is **significant at the Local level**.

Proposed Construction Phase Mitigation

11.179 An Ecological Clerk of Works (ECoW) will be employed to oversee the construction of the wind farm. They will be suitably experienced and will ensure works are carried out in accordance with all relevant construction Method Statements. In the 10 m working area around infrastructure where the potential for habitat disturbance is greatest, the ECoW will work with contractors to identify areas where disturbance is avoidable and where retained habitats need to be protected. These areas will be clearly marked to prevent accidental incursion by construction personnel and machinery.

11.180 An HMP will be drawn up and agreed with NatureScot and this will include methods to protect and improve (enhance) the condition of the retained bog habitats within the Proposed Development. This will include the restoration and protection of peatland through the stabilisation of eroded areas using established techniques. For illustrative purposes, this might include techniques to stop peat in gullies eroding during storm events by using peat plugs as dams where viable (using excavated material); or applying a mixture of heather brash and fibres to the bare peat surface to keep the peat in place and encourage vegetation to establish. The precise location and extent of this will be carefully considered to ensure re-wetting and the installation of any physical structures are compatible with site infrastructure. Specialist hydrological and engineering inputs will be required for this purpose. An outline HMP is presented in **Appendix 11.E**.

11.181 Whilst habitat loss is inevitable during the construction phase, the proposed measures in respect of retained habitats will offset these losses to some extent. It is considered that with mitigation and enhancement the Proposed Development would result in an adverse effect that is **significant at the Site level**.

Operational Phase Effects in the absence of Mitigation

11.182 No further habitat loss or disturbance would take place during the operational phase. The operation of the wind farm would therefore have a **negligible effect** on blanket bog habitats.

Decommissioning Phase Effects in the absence of Mitigation

11.183 In order to assess the decommissioning phase effects it has been assumed that there would be no significant change in bog habitats during the operational life of the wind farm. No additional site drainage or changes to land use are proposed on the areas of retained bog habitat and so no further hydrological changes are anticipated prior to and during the decommissioning phase.

11.184 During the decommissioning process it is anticipated that most decommissioning activities would be confined to the footprint of the existing infrastructure and the 10 m working area around infrastructure and tracks (based on the assumption that all infrastructure will be removed). Impacts beyond this are unlikely. It is highly unlikely that blanket bog will have extended into the footprint of the Proposed Development during the operational phase of the Proposed Development, and for this reason any impacts are likely to be restricted to localised areas within the 10 m working area. It is expected that without mitigation this will result in an adverse effect that is significant at the **Site level** on blanket bog habitat during the decommissioning phase of the Proposed Development.

11.185 It is expected that similar mitigation measures will be adopted to those described for the construction phase. If these measures are adopted the effects of the decommissioning phase are assessed as being adverse and **significant at the Site level** on blanket bog habitat.

Residual Impacts

11.186 Based on the assumption that all the proposed mitigation measures will be adopted, the overall residual effect on blanket bog habitats during the construction phase is assessed as being adverse and **significant at the Site level**. The residual effect of the operational phase in negligible and the residual effect of decommissioning phase is assessed as being adverse and **significant at the Site level**.

11.187 The predicted residual effects of the Proposed Development on blanket bog do not conflict with any national or local planning policies.

Dry Heath

Construction Phase Effects in the Absence of Mitigation

11.188 Although dry heath is not extensive within the Proposed Development, the habitats that will be impacted by the proposed development have been assessed as being of Local importance (rarer dry heath communities evaluated as being of Regional

importance are present within the wider site but will not be impacted and so have not been considered in the assessment). All dry heath communities at the site occur where there is shallow or no peat and only direct localised impacts are anticipated.

11.189 The Proposed Development is predicted to result in the permanent loss of approximately 0.23 hectares of dry heath. Acid dry heath also occurs within the 10 m working area around the proposed new infrastructure; however, any habitat disturbed in this area is likely to recover following completion of the construction phase works and therefore a temporary effect is expected. All the impacted heathland is assigned to the H12 NVC community, which is a widespread habitat in the highlands. None of the rarer heath communities (H13, H21a or H16) will be impacted by the Proposed Development. There is estimated to be between 23 and 32 hectares of dry heath within the Proposed Development so this habitat loss accounts for a small percentage of the total habitat area.

11.190 Overall, taking the extent of the area potentially impacted (and the fact that the scarcer dry heath communities will not be impacted) it is considered that, prior to any mitigation, the Proposed Development will result in an adverse effect that is **significant at the Local level** to heathland habitats.

Proposed Construction Phase Mitigation

11.191 Similar mitigation measures will be adopted to those described for blanket bog. Adoption of these measures will ensure that retained areas of habitat are protected from accidental damage or disturbance. It is inevitable, however, that habitat loss will occur as a result of the Proposed Development, although habitat restoration / enhancement will help to offset this loss. It is therefore considered that the Proposed Development will result in a residual adverse effect that is **significant at the Site level** to heathland habitats.

Operational Phase Effects in the absence of Mitigation

11.192 No further effects on dry heath habitat are expected to arise from the Proposed Development during the operational phase. No further habitat loss or disturbance will take place during this phase of the Proposed Development. The operation of the wind farm would therefore have a **Negligible effect** on heath habitats.

Decommissioning Phase Effects in the absence of Mitigation

11.193 In order to assess the decommissioning phase effects, it has been assumed that no significant changes in the extent of dry heath habitats are likely to have occurred during the operational life of the wind farm in the vicinity of the wind farm infrastructure. No additional site drainage is proposed and no changes to land use such as the planting of conifers are anticipated.

11.194 Most decommissioning activities would be confined to the footprint of the existing infrastructure and tracks and the 10 m working area around all infrastructure and impacts beyond this are unlikely. It is expected that no dry heath habitat will have colonised the footprint of the infrastructure or tracks so that any impacts will be restricted to localised areas within the 10 m working area. It is considered likely that

adverse effects of **Negligible significance** to dry heath habitat will occur during the decommissioning phase of the Proposed Development.

Residual Impacts

11.195 Overall, the residual adverse effects on dry heath habitats during the construction phase are assessed as being **significant at the Site level**. Residual effects of the operational and decommissioning phases are assessed as being of **Negligible significance.**

11.196 The predicted residual effects of the Proposed Development on dry heath do not conflict with any national or local planning policies.

Acid Flush

Construction Phase Effects in the Absence of Mitigation

11.197 Prior to mitigation there would be a small permanent reduction in the area of acid flush due to the construction of access tracks (specifically the track leading to turbine location T6 and the track between turbine locations T5 and T7 – see **Figure 11.5**). It is also possible that indirect impacts will occur through interference with hydrological pathways, either through changes to the amount of water flowing into the flush communities or through potential run-off related siltation or pollution, which would find its way into the flush communities.

11.198 A maximum total area of 0.02 hectare of acid flush will be lost permanently through the construction of the tracks and infrastructure. A further 0.51 ha lies within the SEPA buffer area around all infrastructure and some of this may potentially be impacted through disturbance and damage. There is estimated to be between 4.4 and 8.4 ha of acid flush habitat in the Proposed Development, and the proportion of habitat lost or impacted is therefore relatively small (4.5 – 2.4%).

11.199 The M6 acid flush habitat is identified by SEPA as being a potentially highly groundwater dependent habitat (GWDTE). The effects on the flush communities from potential changes in the quantity and quality of water flows are not easily predicted. The flushes are predominantly associated with the springs and watercourses in the site and therefore any pollution incident or changes to the site hydrology could have wider-ranging effects on any downstream or down-gradient habitats.

11.200 Given that the locations of most examples of the acid flush habitat are in the stream valleys, it is expected that this habitat will be relatively resilient to the effects of the Proposed Development, i.e., pollution and drainage related effects are only likely if a habitat is downstream or down-gradient of an impact source.

11.201 Without mitigation, and taking into account the risk of damage through hydrological changes, it is considered that adverse effects that are **significant at the Local level** could occur due to hydrological impacts upon the acid flushes.

Proposed Construction Phase Mitigation

11.202 Designed-in mitigation measures include the design of infrastructure to allow for maintained hydrological connectivity to the surrounding habitat, for example through the use of cross drains, floating road construction techniques etc. Further details on

design methods to mitigate potential impacts on GWDTEs are discussed in **Chapter 13: Hydrology, Hydrogeology, Geology and Peat**.

11.203 Whilst the proposed measures will mitigate impacts on acid flush habitats, it is inevitable that some habitat loss will occur as a result of the Proposed Development, although habitat restoration / enhancement will help to offset this loss. It is therefore considered that the Proposed Development will result in a residual adverse effect that is **significant at the Site level** on acid flush habitats.

Operational Phase Effects in the absence of Mitigation

11.204 No further effects on acid flush habitats are expected to arise during the operational phase: no further habitat loss or disturbance would take place during this phase of the Proposed Development. The operation of the wind farm would therefore have a **Negligible effect** on acid flush habitats.

Decommissioning Phase Effects in the absence of Mitigation

11.205 In order to assess the decommissioning phase effects, it has been assumed that no significant change in acid flush habitats will have occurred during the operational life of the wind farm. No additional site drainage is proposed and no changes to land use such as the planting of conifers are anticipated.

11.206 Most decommissioning activities would be confined to the footprint of the existing infrastructure and tracks and the 10 m working area around all infrastructure. Impacts beyond this are unlikely. It is considered unlikely that acid flush habitat will have colonised the footprint of the Proposed Development during the operational life of the wind farm, although some habitat recovery is likely to have taken place within the 10 m working area. Consequently, any impacts are likely to be restricted to localised areas within the 10 m working area. It is predicted that, in the absence of mitigation measures, the effect on acid flush habitat is likely to be adverse and **significant at the Local level** during the decommissioning phase of the Proposed Development.

11.207 As noted above for the construction phase, adoption of the same proposed measures during the decommissioning phase will mitigate impacts on acid flush habitats; however, it is possible that some habitat loss will occur as a result of the Proposed Development. Habitat restoration / enhancement will help to offset this loss. It is therefore considered that the decommissioning phase of the Proposed Development will result in a residual adverse effect that is significant at the Site level on acid flush habitats.

Residual Impacts

11.208 Overall, the residual effects on acid flush habitats during the construction phase are assessed as being adverse and **significant at the Site level**. Residual effects of the operational phase are assessed as **negligible**, whilst the residual effect of the decommissioning phase is assessed as being adverse and **significant at the Site level**.

11.209 The predicted residual effects of the Proposed Development on acid flush habitat do not conflict with any national or local planning policies.

Otter

Construction Phase Effects in the Absence of Mitigation

11.210 No otter holts have been identified within the Proposed Development, which is considered to have limited suitability for otter due to the small size of the watercourses (low prey availability) and the limited sheltering opportunities. Consequently, the site has been assessed as being of no more than Site level importance to commuting and foraging otter.

11.211 Based on the current layout, watercourse crossing will be required in two places: the Allt Carn an t-Sean-liathanaich and the very upper reaches of Caochan Tom nan Clach. During the construction phase there is a risk of disturbance of otter, should they be present at the time of works; however, based on the survey results any impact is likely to be limited to the construction of the crossing along the Allt Carn an t-Sean-liathanaich (to accommodate the access track leading to turbine location T6). The other crossing is located where there is little or no suitability for otter.

11.212 There would also be an increased volume of vehicle movements on and around the site resulting from construction traffic. It is possible that increased volumes of traffic could result in a slightly increased risk of otter being hit by moving vehicles, especially where watercourse crossings are proposed. However, this impact is likely to be limited to the Allt Carn an t-Sean-liathanaich. Such an impact is mitigated in part by the designed-in measures for the construction phase (see Designed-in Avoidance, Mitigation, Compensation and Enhancement Measures section above). In addition, a speed limit will be applied within the site, which will help ensure that otter, if present, is avoided. The fact that work will generally take place during the day when otters are least active will also reduce the likelihood of an impact occurring.

11.213 The construction of the watercourse crossing along the Allt Carn an t-Sean-liathanaich has the potential to result in severance of a commuting route used by otter (albeit a route where survey results indicate that it is used infrequently). However, taking into consideration the design and size of the crossing (see **Chapter 3: Description of the Proposed Development**), which will be either a small, culverted crossing or a larger bridge structure, it is highly unlikely that these crossings will be impassable. If otter has to cross a track to continue commuting, the measures set out above will reduce the likelihood of animals being killed or injured.

11.214 Overall, taking into account the small number of watercourse crossings and the limited evidence of use by otter, it is considered that prior to any mitigation, the Proposed Development will result in an adverse effect that is **significant at the Site level** to otter.

Proposed Construction Phase Mitigation

11.215 NatureScot advises that in order to minimise the potential effects on otter due to wind farm developments, detailed pre-construction surveys should be undertaken within a radius of 250 m around each proposed turbine location and associated infrastructure in order that they can be consulted and a mitigation plan and licence application (if required) submitted (https://www.nature.scot/doc/standing-advice-planning-consultations-otters). With respect to access tracks, NatureScot recommends that a

detailed survey of at least 100 m either side of any indicative proposed routes for access tracks is required. These pre-construction surveys would extend along suitable habitat 250 m upstream and downstream of watercourse crossings. Pre-construction surveys of the watercourses and adjacent suitable habitats would be undertaken to update appropriate mitigation and determine any licensing requirements.

11.216 As otter is subject to legal protection, works that have the potential to cause disturbance of otters or which may result in damage or destruction to their places of shelter, would only proceed after an appropriate licence has been issued by NatureScot. In their guidance, NatureScot suggests that, while they should be consulted to determine whether any proposed measures incorporated into the scheme are sufficient to avoid the need for a licence, the disturbance during development works can be minimised by defining an area within at least 30 m of an otter shelter out of bounds to all site users at all times (increasing to 100 m for breeding/natal holts). No places of shelter for otter have been found within the site (and there is very limited suitable habitat).

11.217 Site compounds and welfare facilities would be located well away from any watercourse and lighting would be directed away from watercourses to enable otter to continue to commute (although survey findings suggest this is infrequent) along the watercourses undisturbed.

11.218 Any sightings of otter during the construction phase of the Proposed Development will be reported to the appointed ECoW, who will assess the sightings and consider whether additional mitigation measures are required. By way of illustration this might include further vehicle speed restrictions, the use of temporary warning signs or restricted hours of working in certain areas.

11.219 Taking into account the proposed mitigation, it is considered that the construction phase of the Proposed Development will result in a residual effect that is **negligible** for otter.

Operational Phase Effects in the absence of Mitigation

11.220 No additional significant operational phase effects are considered likely to arise. Maintenance visits to the site will be relatively infrequent and will take place during daylight hours. If speed limits are adhered to impacts on otter are highly unlikely.

11.221 Taking into account the proposed mitigation, it is considered that the operation phase of the Proposed Development will result in a residual effect that is **negligible** for otter.

Decommissioning Phase Effects in the absence of Mitigation

11.222 Decommissioning phase effects are expected to be similar to those described for the construction phase of the Proposed Development.

11.223 Any assessment of potential effects of wind farm decommissioning would take account of new or amended policy, legislation and survey techniques and the results of updated surveys.

11.224 Overall, taking into account the small number of watercourse crossings and the limited evidence of use by otter (which is not expected to change significantly during the life

of the wind farm), it is considered that prior to any mitigation, the Proposed Development will result in an adverse effect that is **significant at the Site level** to otter.

Decommissioning Phase Mitigation

11.225 Updating otter survey would be completed prior to the decommissioning stage in order to update any appropriate mitigation and determine any licensing requirements. Mitigation measures are likely to be similar to those that are proposed for the construction phase of the Proposed Development.

11.226 Taking into account the proposed mitigation, it is considered that the decommissioning phase of the Proposed Development will result in a residual effect that is **negligible** on otter.

Residual Impacts

11.227 During the construction, operation and decommissioning phases, the residual effect of the Proposed Development on otter is assessed as being **negligible**.

11.228 The predicted effects of the Proposed Development on otter do not conflict with any national or local planning policies or the legislative protection afforded to otter.

Bats

Construction Phase Effects in the Absence of Mitigation

11.229 The Proposed Development has no potential roost sites for bats and is used by a limited range of foraging and commuting bats: bat activity levels at monitoring sites have consistently been low. Consequently, the site has been evaluated as being of no more than Site level importance for bats.

11.230 There is potential for limited disturbance of foraging and commuting bats if night working takes place and lighting is required during construction. Lighting may have an effect on bats if there is light spillage onto habitats used by foraging and commuting bats, such as watercourses; however, such effects are likely to be localised and temporary in nature.

11.231 If lighting is required it will be designed in accordance with industry guidance (Institution of Lighting Professionals & Bat Conservation Trust, 2018). This will include careful consideration of the location of lighting, the type of lighting used and the design of a lighting scheme to minimise light spillage onto sensitive habitats.

11.232 With the adoption of the embedded mitigation measures outlined above (specifically the avoidance of night working near watercourses, which may be used by foraging and commuting bats) and the adoption of best practice for lighting design, the effects of construction on bats is assessed to be **negligible**.

Operational Phase Effects in the Absence of Mitigation

11.233 Bats are potentially at risk of collision with wind turbines with fatalities recorded in several European countries. Occasionally mortalities can occur in very high numbers (e.g., Rydell *et al*., 2010).

11.234 Indirect effects of wind turbines may include the displacement or exclusion of bats from their foraging areas and barrier effects that could interfere with migration, commuting routes or access to roosts.

11.235 Current guidance (SNH *et al*., 2019) uses a matrix approach for the purposes of undertaking an initial site risk assessment for wind farm developments. An assessment is made of habitat risk and development size to produce an overall assessment of site risk. Applying this approach, the habitat risk is considered to be 'low' (no roost features, low quality foraging habitat, and an isolated and exposed site) and, for the purpose of this assessment, the development size is assumed to be 'medium' (based on the turbines being 50-100 m height; the development when considered in isolation falls below the 10-40 turbines threshold but meets this threshold when considered cumulatively within the Operational Scheme). This produces an overall habitat risk score of 2 ('low' – see SNH *et al*., 2019).

11.236 A measure of relative bat activity was obtained using the secure online tool EcoBat (http://www.mammal.org.uk/science-research/ecostat/, accessed January 2022). At the current time, the supporting database within the EcoBat tool (which is used for activity level comparison) is limited in terms of the data held. The total available data within the 200 km reference range for comparison of bat activity is below the level recommended by EcoBat for meaningful analysis (the recommended comparison data set size is 2000+ survey nights - the maximum data set available for comparison against the survey data for the Proposed Development is 312 nights, i.e., less than 20% of the recommended comparison data set).

11.237 Taking into account the limitations associated with the use of the EcoBat tool, the output needs to be treated with caution when using it to inform the assessment and the conclusions reached. The outputs from the EcoBat tool are discussed further in Technical **Appendix 11.B**.

11.238 Overall, it is concluded that there is a low likelihood of the Proposed Development resulting in a significant impact on bats. Three species / species groups have been recorded using the site: common pipistrelle, which is the dominant species, soprano pipistrelle (where only 16 bat calls were recorded) and *Myotis* sp. (where a total of 53 bat calls were recorded). All three species/ species groups are considered to be medium risk with regard to population-related impacts (SNH *et al*., 2019).

11.239 The static bat detector survey data collected to date indicates that bat activity levels are low at all survey locations, i.e., low numbers of bat passes have been recorded. Analysis using EcoBat indicates that the overall risk category is Low or Medium for the monitoring points used, based on the assumption that the development is 'medium' in size. If, however, the project is assumed to be 'small' in size (based on turbine number alone) then the overall risk category is Low for all monitoring points and species.

11.240 According to large-scale studies in Germany (Rydell *et al*., 2010; Bach & Rahmel, 2004), the majority of pipistrelle collisions occur where turbines are located within forests. The available evidence for this site indicates that pipistrelles are unlikely to be at risk of turbine collision as the turbine locations are all on open upland habitats and are over 400 m from the nearest woodland.

11.241 Taking all this into account, it is considered that the effect of the Proposed Development on bats would be adverse and **significant at the Site level** only.

Proposed Operational Phase Mitigation

11.242 As the risk of bat collision is very low, with low numbers of three bat species potentially at risk, no specific control measures are proposed. The layout of the Proposed Development avoids any habitats that may be of importance to foraging and commuting bats, such as woodland edge, areas of scrub and watercourses. It is considered that the effect of the Proposed Development on bats would be adverse and **significant at the Site level** during the operational phase.

Decommissioning Phase Effects in the absence of Mitigation

11.243 Decommissioning phase impacts are expected to be similar to those described for the construction phase of the Proposed Development.

11.244 Any assessment of potential effects of wind farm decommissioning would take account of new or amended policy, legislation and survey techniques and the results of updated surveys. Mitigation measures are likely to be similar to those that are proposed for the construction phase of the Proposed Development.

11.245 Taking into account the proposed mitigation, it is considered that the decommissioning phase of the Proposed Development will result in a **negligible** effect on bats as the wind farm will have ceased to operate and so there will be no risk of collision or disturbance effects from operating wind turbines.

Residual Impacts

11.246 During the construction phase, the effect of the Proposed Development on bats is assessed as being **negligible**. A similar effect is predicted for the decommissioning phase. During the operational phase the residual effect on bats is assessed as being adverse and **significant at the Site level.**

11.247 The predicted effects of the Proposed Development on bats do not conflict with any national or local planning policies or the legislative protection afforded to bats.

Reptiles

11.248 Whilst reptiles have been scoped out of the EIA assessment, precautionary mitigation measures will be implemented in order to ensure legal compliance. Specifically good practice measures will be put in place (including a watching brief by an ecologist) to avoid the risk of killing / injuring individual animals when vegetation clearance is being completed. These measures will be included within the CEMP.

Water vole

11.249 Whilst water vole has been scoped out of the EIA assessment, precautionary mitigation measures will be implemented in order to ensure legal compliance. Specifically, pre-construction surveys of watercourses and adjacent suitable habitats will be undertaken to check for any new evidence of colonisation. Depending upon the results of these surveys the mitigation requirements will be updated as appropriate. These measures will be included within the CEMP.

Mountain hare

Construction Phase Effects in the Absence of Mitigation

11.250 Habitat loss during the construction phase will occur within areas of open moorland which is the habitat with the greatest potential for supporting mountain hare. The loss or disturbance of this habitat could therefore result in the displacement of mountain hares, and potentially the injury or death of animals.

11.251 Although construction related effects are possible, the spatial extent of these effects would be localised and limited in their extent. For example, the construction of access tracks would only impact on an area of habitat approximately 5m wide with a potential working area extending up to 10m either side. Consequently, there would be opportunities for hares to relocate to the extensive areas of adjacent undisturbed habitat which is widespread in the surrounding area.

11.252 The potential impacts identified for hares principally relate to killing and injury of animals, habitat loss resulting from construction works and disturbance related displacement. These effects would be localised and would affect a relatively small area of habitat (and probably a small number of animals). In the absence of mitigation these effects are assessed as being adverse and **significant at the Site level**.

Proposed Construction Phase Mitigation

11.253 Good practice measures will be put in place (including a watching brief by an ECoW) to avoid the risk of killing / injuring of individual animals when vegetation clearance is being completed. These measures will be included within the CEMP produced for the Proposed Development. Whilst this will reduce the risk of animals being killed or injured, it will not reduce the risk of disturbance related displacement. The residual effects are assessed as being adverse and **significant at the Site level**.

Operational Phase Effects in the absence of Mitigation

11.254 As habitat loss is limited to the construction phase only, no further potential impacts to mountain hare are anticipated to arise during the operational phase. Maintenance visits to the site will be relatively infrequent and will take place during daylight hours. If speed limits are adhered to impacts on hares are highly unlikely. The residual effects are assessed as being **negligible**.

Decommissioning Phase Effects in the absence of Mitigation

11.255 No additional habitat loss is anticipated to occur during the decommissioning phase and consequently no additional significant impacts to mountain hare are considered likely to arise. If speed limits are adhered to impacts on hares are highly unlikely. The residual effects are assessed as being **negligible**.

Residual Impacts

11.256 During the construction phase, the effect of the Proposed Development on mountain hare is assessed as being adverse and **significant at the Site level**. The residual effects for the operational phase and decommissioning phase are assessed as being **negligible**.

11.257 The predicted effects of the Proposed Development on mountain hare do not conflict with any national or local planning policies or the legislative protection afforded to this species.

Fish and fish habitats

Construction Phase Effects in the Absence of Mitigation

11.258 The Proposed Development has been assessed as being of County value to brown trout. The construction of internal tracks will require a watercourse crossing along the Allt Carn an t-Sean-liathanaich (to provide access to turbine location T6) at a section of the watercourse where habitat quality for juvenile trout was judged to be good; however, spawning opportunities appeared to be quite limited, and largely restricted to small pockets of gravel stabilised around boulders.

11.259 A second crossing location (where the track will provide access to turbine location T4) is proposed along the upper reaches of Caochan Tom nan Clach. Whilst the lower reaches of this watercourse were judged to provide good trout fry habitat, the upper reaches (including the location of the proposed watercourse crossing) were judged to be of poor quality for fish, comprising a tiny channel partly flowing beneath the turf and an indistinct, rush-filled channel.

11.260 Given the lack of suitable spawning habitats within the central and western parts of the Proposed Development, impacts to potential spawning habitat of brown trout are likely to be limited to the construction of the watercourse crossing across the Allt Carn an t-Sean-liathanaich to provide access to turbine location T6.

11.261 Culverts and bridging structures would be designed and constructed in such a manner to allow fish passage (except where they are located in fishless headwater streams) in accordance with SEPA guidance on river crossings (SEPA, 2010) and the SEPA position statement on culverting of watercourses (2015). As such no severance to upstream habitat is anticipated.

11.262 During the construction phase diffuse and point source pollution impacts from construction works near watercourses have the potential to affect stream habitats and fish populations. Typical sensitivities around wind farm developments and salmonid fish relate mainly to the exposure of large areas of bare soil and the potential for siltation. Inputs of silt and other fine material including peat, can cause damage to fish habitats and direct mortality of fish and ova. Spawning habitats can be particularly at risk in the event of siltation since clogging of interstitial space with fine material prevents oxygen reaching eggs and alevins.

11.263 Overall, taking into account the small number of watercourse crossings and the limited occurrence of suitable fish habitats at these locations, it is considered that prior to any mitigation, the Proposed Development will result in an adverse effect that is **significant at the Local level** to brown trout.

Proposed Construction Phase Mitigation

11.264 In order to avoid the loss of potential spawning habitat a pre-construction survey will be completed in order to inform the micro-siting of the track to avoid significant areas of suitable spawning substrate.

11.265 Potential issues relating to the exposure of fish habitats to silt and other fine material build-up during the construction phase would be minimised by following standard good practice procedures and the relevant Guidance for Pollution Prevention (https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/guidance-for-pollution-prevention-gpps-full-list/).
Detailed pollution prevention plans and construction method statements would be included in the CEMP.

11.266 With the adoption of the mitigation measures outlined above (specifically the adoption of best practice construction measures to minimise pollution risk), the effects of construction on fish would be **negligible**.

Operational Phase Effects in the absence of Mitigation

11.267 During the operational phase there will be no further impacts on the watercourses within the site. Consequently, the operation phase effects on the fish population within the site as a result of the Proposed Development is assessed as being **negligible**.

Decommissioning Phase Effects in the absence of Mitigation

11.268 No additional habitat loss is anticipated to occur during the decommissioning phase. There is the potential for impacts to occur as a result of changes in water quality, for example as a result of siltation, resulting in similar effects to those described for the construction phase.

11.269 Overall, taking into account the small number of watercourse crossings and the limited occurrence of suitable fish habitats at these locations, it is considered that prior to any mitigation, the Proposed Development will result in an adverse effect that is **significant at the Local level** to brown trout.

Proposed Decommissioning Phase Mitigation

11.270 Mitigation measures will be the same as proposed for the construction phase. Standard good practice procedures and the relevant Guidance for Pollution Prevention (https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/guidance-for-pollution-prevention-gpps-full-list/) will be followed. Detailed pollution prevention plans and construction method statements would be included in the CEMP.

11.271 With the adoption of the mitigation measures outlined above (specifically the adoption of best practice construction measures to minimise pollution risk), the effects of decommissioning on fish would be **negligible**.

Residual Impacts

11.272 During the construction, operational and decommissioning phases the residual effect of the Proposed Development on fish is assessed as being **negligible**, based on the assumption that all mitigation measures are adopted.

11.273 The predicted effects of the Proposed Development on fish do not conflict with any national or local planning policies or the legislative protection afforded to fish.

Summary of Residual Effects

11.274 The following species and habitats were scoped out of detailed impact assessment because they have not been recorded on the Site (and are not likely to be present), are not likely to be affected, or are of low conservation importance (either inherently or by virtue of their extent within the Site):

- *great crested newt;*
- *reptiles;*
- *water vole;*
- *badger;*
- *pine marten;*
- *wildcat;*
- *juniper scrub; and*
- *acid grassland.*

11.275 Tables 11.5 and 11.6 below summarise the habitats and species that have been assessed, and the residual effects of the Proposed Development upon them for both the construction and operational phases. Decommissioning impacts are anticipated to be similar to the construction phase.

11.276 Overall, the residual effects of the Proposed Development on all important ecological features (designated sites, habitats, species and the habitats that support those species) do not conflict with any national or local planning policies or any relavent legislative protection. The residual effects are not considered to be significant in EIA terms.

Table 11.5: Summary of residual effects – construction phase

Important Ecological Feature (IEF)	Importance of IEF	Nature of impact (in absence of mitigation)	Duration of impact	Mitigation	Magnitude of impact	Significance of impact (EIA)
Blanket bog	County	Adverse (Loss, damage or disturbance during construction) Beneficial (enhancement of retained bog)	Permanent loss; Temporary damage or disturbance Permanent enhancement	Area lost has been minimised; measures to protect hydrology Habitat enhancement will offset effects	Low	Site - Not significant
Dry heath	Local	Adverse (Loss, damage or disturbance during construction) Beneficial (enhancement of retained habitat)	Permanent loss; Temporary damage or disturbance Permanent enhancement	Area lost has been minimised Habitat enhancement will offset effects	Low	Site - Not significant
Acid flush	Local	Loss, damage or disturbance during construction	Permanent loss; Temporary damage or disturbance	Area lost has been minimised; measures to protect hydrology	Low	Site - Not significant
Otter	Site level	Disturbance or displacement; local habitat fragmentation	Temporary (construction and decommissioning phases only)	Pre-construction surveys; environmental protection measures	Low	Negligible - Not significant
Bats	Site level	Small-scale disturbance from lighting (if required)	Temporary (construction and decommissioning phases only)	Avoidance; lighting design; environmental protection measures	Negligible	Negligible - Not significant
Mountain hare	Local level	Disturbance or displacement; risk of harm during vegetation clearance	Temporary (construction and decommissioning phases only)	Avoidance; ECoW supervision during vegetation clearance	Low	Site - Not significant
Fish (brown trout)	County	Changes in water quality including silt depostion; risk of damage to spawning habitat; habitat fragmentation	Permanent habitat loss; temporay water quality damage (construction and decomissioning phases only)	Adherence to SEPA GPPs, CEMP approved by SEPA, minimisation of watercourse crossings and design in line with best practice	Low	Negligible - Not significant

Table 11.5: Summary of residual effects – operation phase

IEF	Importance of IEF	Nature of impact	Duration of impact	Mitigation	Magnitude of impact	Significance of impact
Blanket bog	County	Negligible	n/a	Avoidance; environmental protection measures	Negligible	Site - Not significant
Dry heath	Local	Negligible	n/a	Avoidance; environmental protection measures	Negligible	Negligible - Not significant
Acid flush	Local	Negligible	n/a	Avoidance; environmental protection measures	Negligible	Site - Not significant
Otter	Site	Negligible	n/a	Avoidance; environmental protection measures	Negligible	Negligible - Not significant
Bats	Site	Collision realted mortality or injury during operational phase	Permanent	Low levels of bat activity and no high risk species present; no turbines within 400 m of woodland or near watecourses	Low	Negligible - Not significant
Mountain hare	Local	Negligible	n/a	Avoidance; environmental protection measures	Negligible	Negligible - Not significant
Fish	County	Negligible	n/a	Avoidance; environmental protection measures	Negligible	Negligible - Not significant

Cumulative Assessment

11.277 Lethen Wind Farm is a proposed 17 turbine scheme located approximately 5 km east of the Proposed Development and has been identified for assessment of effects in combination with the Proposed Development. A planning application was submitted for Lethen Wind Farm in January 2022.

11.278 The potential for cumulative effects to occur from the Proposed Development and the proposed Lethen Wind Farm arises principally if species from the same population are reliant on both sites. The likelihood of this can be assessed through an analysis of the species assemblage that is present within the Proposed Development and by examining the likely range and territory size of those species. There is also potential for cumulative effects to occur if the conservation status of habitats are affected by the combined loss or harm to those habitats.

11.279 Both the Proposed Development and Lethen Wind Farm are within the River Findhorn catchment; however, the Lethen Wind Farm drains into the upper reaches of the Tor

Burn before its confluence with the Rhilean Brun which drains the Proposed Development. As both wind farms drain into the lower Tor Burn it is possible that cumulative impacts could occur as a result of pollution. However, with mitigation and monitoring in place no cumulative effects on the fish populations are expected as it is reasonable to expect that pollution risk will be managed and controlled within each site. Furthermore, the results of survey have led to the conclusion that migratory fish species are not likely to be present in the Proposed Development site due to natural obstruction to their passage.

11.280 Only bats are considered capable of ranging between the Proposed Development and Lethen Wind Farm; however, this is considered unlikely to happen to any significant extent as bats have been recorded infrequently within the Proposed Development where the habitats are considered to be poor for foraging and commuting.

11.281 Given the findings of bat survey work completed at the Proposed Development, and the similar habitats present within Lethen Wind Farm, cumulative impacts in respect of bats are considered to be unlikely and of negligible significance.

11.282 Whilst mountain hare is a highly mobile species, it is considered unlikely that individuals will have territories that include both developments. The cumulative effects on mountain hare through loss of habitat and disturbance are therefore considered of negligible significance.

11.283 Baseline ecology surveys were undertaken in 2019 at the Lethen Wind Farm site. These included Phase 1 and National Vegetation Classification (NVC) habitat surveys, protected mammal surveys and bat surveys (roost assessment and activity surveys). Additional Phase 1 and NVC habitat surveys were undertaken in 2021 in areas not previously surveyed in 2019 that were within 300 m of the proposed wind farm infrastructure.

11.284 An assessment of the predicted significance of effects of the proposed wind farm on ecological interests concluded that there were no predicted significant effects on any of the Important Ecological Features (IEFs) recorded and no significant cumulative effects on any IEFs.

Table11.6 – Cumulative Effects Summary Table

Description of Effect	Cumulative Wind Farm		Significance of Potential Cumulative Effect		Mitigation Measure	Significance of Residual Effect	
	Wind Farm	Status	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse
Effect to population of bats from loss of habitat and disturbance	Lethen Wind Farm	Application	No effect likely due to separation distance between the sites and poor habitat quality	Neutral	N/A	Neutral	Neutral
Effect to population of mountain hare from loss of habitat and disturbance	Lethen Wind Farm	Application	No effect likely due to separation distance between the sites	Neutral	N/A	Neutral	Neutral
Effect to fish from changes in runoff and drainage and pollution incident	Lethen Wind Farm	Application	Minor	Adverse	Infrastructure sited 50m buffer from watercourse Follow GPPs. No fuelling near watercourses.	Neutral	Neutral

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