CONTENTS

INTRODUCTION

8.1 This chapter describes and evaluates the current nature conservation interest of the site and study areas. The chapter evaluates both habitats and non-avian animal species and assesses the potential impacts of the proposed development on habitats and species above a certain value. Potential impacts on birds are considered separately in **Chapter 9: Ornithology**.

8.2 This chapter has been prepared by Atmos Consulting Ltd., led by a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

8.3 A scoping exercise undertaken in March 2021 (see **Chapter 6: Scoping and Consultation**) was informed by extended Phase 1 habitat and National Vegetation Classification (NVC) surveys carried out in September / October 2020. Scoping identified the need for, and scope of, the subsequent ecological surveys carried out on the site during 2021.

8.4 The results of the baseline surveys were used to inform the turbine and associated wind farm infrastructure and design, and also form the basis of the detailed assessment presented in this chapter. The results of the detailed ecological surveys undertaken are summarised in this chapter, with more details provided in a number of technical appendices, as shown in **Table 8-1**.

Table 8-1: Ecological Studies Undertaken for the Assessment

Study	Date Undertaken	Location in EIA Report
Extended Phase 1 Habitat and NVC Surveys	September / October 2020 July 2021	Technical Appendix 8.1
Bat Survey	May to September 2021	Technical Appendix 8.2
Protected Mammal Surveys	July and September 2021	Technical Appendix 8.3
Fish Habitat Survey	September 2021	Technical Appendix 8.4
Draft Habitat Management Plan		Technical Appendix 8.5
Deer Management Statement		Technical Appendix 8.6

8.5 Planning policies, legislation, and guidance of relevance to this assessment are provided in **Technical Appendix 4.1: Legislation, Planning Policy and Guidance**.

SCOPE AND CONSULTATION

Consultation and Scoping Responses

8.6 A formal scoping exercise was undertaken in March 2021 as described in **Chapter 6: Scoping and Consultation**. In relation to non-avian ecology and nature conservation, scoping responses were sought from The Highland Council (THC), NatureScot, SEPA and RSPB.

8.7 **Table 8-2** provides a summary of the key issues relating to non-avian ecology raised during the formal Scoping exercise undertaken in March 2021 (also see **Technical Appendix 6.1: Scoping Response Table**). Any additional communications with key stakeholders which took place outside of the formal Scoping process are also detailed.

Table 8-2: Consultee Responses Relating to Non-avian Ecology

Consultee	Responses Relevant to Non-avian Ecology	Comment
The Highland Council – Scoping – 25/05/2021	The EIA Report should provide a baseline survey of the bird and animals (mammals, reptiles, amphibians, etc) interest on site. It needs to be categorically established which species are present on the site, and where, before a future application is submitted. Further the EIA Report should provide an account of the habitats present on the proposed development site. It should identify rare and threatened habitats, and those protected by European or UK legislation, or identified in national or local Biodiversity Action Plans. Habitat enhancement and mitigation measures should be detailed, particularly in respect to blanket bog, in the contexts of both biodiversity conservation. Details of any habitat enhancement programme (such as native- tree planting, stock exclusion, etc) for the proposed site should be provided. It is expected that the EIA Report will address whether or not the development could assist or impede delivery of elements of relevant Biodiversity Action Plans.	Baseline survey information will be presented as Technical Appendices (TA) to the EIA Report (**TA 8.1: Extended Phase 1 and NVC Surveys**, **TA 8.2: Bat Survey**, **TA 8.3: Protected Species Survey**, **TA 8.4: Fish Habitat Survey**).
	The presence of protected species such as Schedule 1 Birds or European Protected Species must be included and considered as part of the application process, not as an issue which can be considered at a later stage. Any consent given without due consideration to these species may breach European Directives with the possibility of consequential delays or the project being halted by the EC. Please refer to the comments of NatureScot and RSPB in this respect.	Baseline survey information will be presented as Technical Appendices (TA) to the EIA Report (**TA 8.2: Bat Survey**, **TA 8.3: Protected Species Survey**). Potential impacts of the development on species and habitats will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167).

	The EIA Report should address the likely impacts on the nature conservation interests of all the designated sites in the vicinity of the proposed development. It should provide proposals for any mitigation that is required to avoid these impacts or to reduce them to a level where they are not significant. NatureScot can also provide specific advice in respect of the designated site boundaries for SACs and SPAs and on protected species and habitats within those sites. The potential impact of the development proposals on other designated areas such as SSSI's should be carefully and thoroughly considered and, where possible, appropriate mitigation measures outlined in the EIA Report. NatureScot provide advice on the impact on designated sites.	Potential impacts of the development on species and habitats will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167).
	If wild deer are present or will use the site an assessment of the potential impact on deer will be required. This should address deer welfare, habitats and other interests.	Baseline survey information will be presented as Technical Appendices (TA) to the EIA Report (**TA 8.6: Deer Management Statement**). Potential impacts of the development on species and habitats will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167).
	The EIA Report needs to address the aquatic interests within local watercourses, including downstream interests that may be affected by the development, for example increases in silt and sediment loads resulting from construction works; pollution risk / incidents during construction; obstruction to upstream and downstream migration both during and after construction; disturbance of spawning beds / timing of works; and other drainage issues. The EIA Report should evidence consultation input from the local fishery board(s) where relevant.	Baseline survey information will be presented as Technical Appendices (TA) to the EIA Report (**TA 8.4: Fish Habitat Survey**). Potential impacts of the development on species and habitats will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167).
	The EIA Report should include an assessment of the effects on Ground Water Dependent Terrestrial Ecosystems (GWDTE).	Baseline survey information relating to habitats is presented in **TA 8.1: Extended Phase 1 and NVC Surveys**. Potential effects on any identified GWDTE habitat will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167).

The Highland Council – Scoping Addendum – 03/08/2021	Further to receipt of the attached, thank you for re-consulting THC on the scope of the forthcoming EIA Report for the above proposal. Following a review of the EIA Scoping Addendum, the Planning Authority does not wish to bring any additional matters to the prospective applicant's attention and are satisfied that matters to be assessed remain as per our previous 25 May 2021 response.	Noted.
NatureScot – Scoping – 13/05/2021	This proposal has the potential to adversely affect a number of nationally important natural heritage interests. If adverse impacts on these national interests cannot be mitigated then we may object to the proposal. Our detailed advice is provided in Annex 1 of this letter. In addition to our detailed advice given in Annex 1 of this letter, the applicant should refer to our 'general scoping and pre-application advice' note.	Noted. The 'general scoping and pre-application advice' note has been considered.
	The Caithness and Sutherland Peatlands Special Area of Conservation (SAC) is protected for its upland habitats and otter features. The application site boundary extends into the SAC. Given the close proximity between the SAC and the application site, a likely significant effect can be concluded. It is therefore important that the EIA Report provides enough information to allow us to determine if the proposal could have an adverse impact on the integrity of the SAC.	The design of the proposed development has been the subject of an extensive design process which has resulted in an amended boundary that is now largely outwith and immediately adjacent to the Caithness and Sutherland Peatlands SAC. There is a small overlap in the north west of the site to incorporate the entirety of the forestry block as part of the proposed Habitat Management Plan (**TA 8.5: Draft Habitat Management Plan**). Baseline survey information will be presented as Technical Appendices (TA) to the EIA Report (**TA 8.3: Protected Species Survey**, **TA 9.4: Shadow Habitats Regulations Assessment**). Potential impacts of the development on qualifying species and habitats of adjacent environmentally designated sites will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167).
	We welcome the proposal within the scoping report that careful consideration will be given to impacts of site design on Caithness and Sutherland Peatlands SAC. We advise that no works should be proposed within the SAC boundary and that robust mitigation measures should be proposed within the EIA Report to ensure there are no direct or indirect impacts on the SAC's qualifying features. Further to this we welcome the otter survey to allow	The design of the proposed development has been the subject of an extensive design process which has resulted in an amended boundary that is now largely outwith and immediately adjacent to the Caithness and Sutherland Peatlands SAC. There is a small overlap in the north west of the site to incorporate the entirety of the forestry block as part of the proposed Habitat

	assessment of potential impacts on the SAC's otter feature.	Management Plan (**TA 8.5: Draft Habitat Management Plan**). Baseline survey information will be presented as Technical Appendices (TA) to the EIA Report (**TA 8.3: Protected Species Survey**, **TA 8.5: Draft Habitat Management Plan**). Potential impacts of the development on qualifying species and habitats of adjacent environmentally designated sites will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167).
	Strathy Coast SSSI is protected for its coastal habitats, birds and geology feature and is located 2.4km north of the application site. The watercourses within the application site drain into the coastal waters within the SSSI. We advise that it is unlikely that the SSSI habitats will be affected by the proposed development however given the hydrological connectivity then potential impacts should be assessed within the EIA Report.	Potential impacts of the development on qualifying species and habitats of adjacent and nearby environmentally designated sites will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167).
	We welcome the proposed protected species surveys as outlined in the scoping report. If any protected species are identified then Species Protection Plans should be produced and included within the EIA Report.	Baseline survey information will be presented as Technical Appendices (TA) to the EIA Report (**TA 8.2: Bat Survey**, **TA 8.3: Protected Species Survey**). Potential impacts of the development on species and habitats will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167) and measures identified which could be incorporated into Species Protection Plans that will be produced prior to construction commencing.
	If wild deer are present on or will use the development site, an assessment of the potential impacts on deer welfare, habitats, neighbouring and other interests (e.g. access and recreation, road safety, etc.) should be presented with in the EIA Report. Where significant impacts may be caused, a draft deer management statement will also be required to address the impacts. Please refer to our guidance "What to consider and include in deer assessments and management at development sites". We would encourage the applicant, in line with The Code of Practice on Deer Management, to	Baseline survey information will be presented as Technical Appendices (TA) to the EIA Report (**TA 8.6: Deer Management Statement**). Potential impacts of the development on species and habitats will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167). Deer are present across the site and as such a Deer Management Statement will be provided as a Technical Appendix to the

	collaborate with neighbours and other interested parties, as well as the Northern Deer Management Group during the assessment and any subsequent management. If a Deer Management Statement is produced then it should comply with the Best Practice Guidance on Deer Management Plans.	EIA Report (**TA 8.6: Deer Management Statement**).
NatureScot – Scoping Addendum – 19/07/2021	Overall we are satisfied with the proposals within the Addendum with regards to landscape, peat, ornithology and protected species. We do however encourage the applicant to get in touch with us at their earliest convenience to discuss the scope of the wild land assessment. We have no additional advice to offer at this stage.	Noted.
Fisheries Management Scotland – Scoping – 28/04/2021	Fisheries Management Scotland (FMS) represents the network of 41 Scottish District Salmon Fishery Boards (DSFBs) including the River Tweed Commission (RTC), who have a statutory responsibility to protect and improve salmon and sea trout fisheries and the 26 fishery trusts who provide a research, educational and monitoring role for all freshwater fish. FMS act as a convenient central point for Scottish Government and developers to seek views on local developments. However, as we do not have the appropriate local knowledge, or the technical expertise to respond to specific projects, we are only able to provide a general response with regard to the potential risk of such developments to fish, their habitats and any dependent fisheries. Accordingly, our remit is confined mainly to alerting the relevant local DSFB/Trust to any proposal. The proposed development falls within the catchment relating to the Northern DSFB and Flow Country Rivers Trust. It is important that the proposals are conducted in full consultation with both organisations (see link to FMS member DSFBs and Trusts below). We have also copied this response to Alexa MacAuslan at the DSFB and Eleanor Constable at the Trust. Due to the potential for such developments to impact on migratory fish species and the fisheries they support, FMS have developed, in conjunction with Marine Scotland Science, advice for DSFBs and Trusts in dealing with planning applications. We would strongly recommend that these guidelines are fully considered throughout the planning, construction and monitoring phases of the proposed development.	Northern DSFB and Flow Country Rivers Trust have been consulted (Scoping and Scoping Addendum). Baseline survey information will be presented as Technical Appendices (TA) to the EIA Report (**TA 8.4: Fish Habitat Survey**). Potential impacts of the development on species and habitats will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167).

Flow Country Rivers Trust – Scoping – 28/04/2021	The interests of the Trust with regard to this development mirror those of the Northern District Salmon Fishery Board and I am assured that they have been covered in their response to you.	Baseline survey information will be presented as Technical Appendices (TA) to the EIA Report (**TA 8.4: Fish Habitat Survey**). Potential impacts of the development on species and habitats will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167).
The Northern District Salmon Fishery Board – Scoping – 19/04/2021	The NDSFB has a statutory duty to preserve and protect salmon and sea trout in its area which includes the River Halladale. The proposed Kirton wind farm site is drained by two tributary streams to the River Halladale - the Allt na h-Eaglaise and the Allt nan Gall. Both streams offer potentially suitable habitat for spawning adult salmon and sea trout and for the rearing of their juvenile stages. Additionally, the parts of both streams that lie within the proposed wind farm site may also be an important spawning and rearing resource for the resident trout populations present in Loch na Eaglaise Mor and Loch nan Gall, although the lochs themselves lie outside the wind farm site. Accordingly, NDSFB would wish to see full habitat and fisheries surveys performed for both Allt na h-Eaglaise and Allt nan Gall, covering those parts of both streams that are within the proposed wind farm site and also the stream reaches between the proposed wind farm site and the River Halladale itself. Based on the survey results, NDSFB would expect any necessary measures for the protection of fish and aquatic habitat be specified in any planning application and adopted should the application succeed.	Baseline survey information will be presented as Technical Appendices (TA) to the EIA Report (**TA 8.4: Fish Habitat Survey**) and will include any proposed mitigation. Potential impacts of the development on species and habitats will be addressed within the EIA Report (**Chapter 8: Ecology** paragraphs 8.100 – 8.167).
Royal Society for the Protection of Birds (RSPB) – Scoping – 11/05/2021	A draft or outline Habitat Management Plan (HMP) should be prepared as part of the EIA and submitted with the application. This should have sufficient detail to allow consideration of its feasibility and effectiveness in providing any proposed mitigation and/or compensation and enhancement. The HMP, or other document, should also include information on post-construction monitoring of birds, including reporting of collision mortality.	A draft Habitat Management Plan has been prepared and is submitted as a Technical Appendix to the EIA Report (**TA 8.5: Draft Habitat Management Plan**). Felling of the plantation forestry block in the north west of the site is included as part of the planned habitat improvements. This area would then be restored as peat bog habitat.

	Once impacts are mitigated, opportunities to enhance the site for biodiversity should be taken. Potential for the restoration of suitable area of blanket bog as part of the applicant's enhancement proposals should be explored to improve habitat and reduce the carbon payback period. We note that no forestry felling is currently anticipated as part of the proposed development, however, felling and re-wetting the plantation areas on the site would be a significant opportunity for habitat restoration and biodiversity enhancement as per Scottish Forestry guidance. We also note the site is currently grazed and so there may be opportunities for drain blocking and other re-wetting actions.	

ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

8.8 The CEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2016) (henceforth referred to as the CIEEM guidelines) form the basis of the impact assessment presented in this chapter. These guidelines set out a process of identifying the value of each ecological receptor and then characterising the impacts that are predicted, before discussing the effects on the integrity or conservation status of the receptor, proposed mitigation and significance of effects of any residual impacts predicted.

8.9 The following definitions of the terms 'impact' and 'effect' are used in this chapter:

- impact – actions resulting in changes to an ecological feature. For example, the construction activities of a development removing a hedgerow.
- effect – outcome to an ecological feature from an impact. For example, the effects on a dormouse population from loss of a hedgerow.

8.10 The initial action for any Ecological Impact Assessment (EcIA) is to determine which features should be subject to detailed assessment. The ecological receptors to be the subject of more detailed assessment should be of sufficient value that impacts upon them may result in effects which are significant in terms of either legislation or policy. The receptors should also be vulnerable to significant impacts arising from the proposed development.

8.11 All designated nature conservation sites, plant and animal species, habitats and integrated plant and animal communities that occur within the 'zone of influence' of the proposed development are defined as potential ecological features (as described below). The zone of influence for a project is defined here as the area over which ecological features may be affected by biophysical changes as a result of the proposed development and associated activities. The zone of influence is likely to extend beyond the site, for example where there are ecological or hydrological links beyond the site boundary. The zone of influence will also vary for different ecological features, depending on their sensitivity to environmental change.

Determining Value

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

- international (nature conservation designation, habitat or populations of species of international importance, e.g. a SAC or significant numbers of a designated population outside the designated site);
- national (nature conservation designation, habitat or populations of species of Scottish importance, e.g. a Site of Special Scientific Interest (SSSI) or a National Nature Reserve (NNR), a nationally important population / assemblage of a European Protected Species and / or a species listed on Schedule 5 of the Wildlife and Countryside Act 1981);
- regional (nature conservation designation, habitat or populations of species of Highland Council Area importance, e.g. a site / population that meets SSSI designation criteria but has not been designated due to better examples being present in the regional area or a regionally important population / area of a Scottish Biodiversity List (SBL) priority species / habitat);
- local (i.e. within 5km) (a nature conservation site, habitat or species of importance in the local or district area, e.g. a breeding population / viable area of an SBL or local BAP species / habitat); and
- less than local (unremarkable habitat / common species of little or no intrinsic nature conservation value).

Valuing Habitats

8.13 The value of habitats, according to the CIEEM guidelines, is measured against published selection criteria where available. Reference may therefore be made to SBL and Habitat Action Plans (HAPs) contained within the Highland LBAP. As the guidelines note, the presence of a HAP reflects the fact that the habitat concerned is in a sub-optimal state and hence the action plan is required and a HAP does not, therefore, necessarily imply any specific level of importance for the habitat. It must be noted, in accordance with the guidance, that features may be assigned greater value if there is reasonable chance that they can be restored to a higher value in the future.

Valuing Species

8.14 In assigning a level of value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. Rarity is an important consideration because of its relationship with threat and vulnerability although, because some species are inherently rare, it is necessary to look at rarity in the context of status. A species that is rare and declining should be assigned a higher level of importance than one that is rare with a stable population. Reference may also be made to SBL and Species Action Plans (SAPs) contained within the Highland LBAP and other indicators of conservation status, as appropriate, although, as above with HAPs, the existence of a SAP does not necessarily imply any specific level of importance.

Predicting and Characterising Impacts and Effects

8.15 The CIEEM guidelines suggest that the process of predicting ecological impacts and effects should take account of relevant ecosystem structure and function such as:

- available resources – e.g. territory, food and water;
- environmental process – e.g. flooding, erosion, eutrophication, deposition and climate change;
- ecological processes and relationships – e.g. population dynamics, vegetation dynamics and predator / prey relationships;
- human influences – e.g. animal husbandry, burning, pollution, disturbance from public access; and
- historical context – e.g. natural range of variation, historical human influences and geomorphological evolution.

8.16 In accordance with the CIEEM guidelines, when describing impacts and effects, reference is made to the following, where appropriate:

- confidence in predictions – the level of certainty that an impact will occur as predicted, based on professional judgement and where possible evidence from other schemes – this is based on a four point scale: certain / near certain; probable; unlikely; and extremely unlikely;
- magnitude – the size of an impact in quantitative terms where possible;
- extent – the area over which an impact occurs;
- duration – the time for which an impact is expected to last;
- reversibility – a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A temporary impact is one from which a spontaneous recovery is possible; and
- timing and frequency – i.e. whether impacts occur during critical life stages or seasons.

8.17 Both direct and indirect impacts are considered: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or receptor, e.g. external sourcing of stone for road surfaces may cause growth of plant species not generally found in that area of the application site.

8.18 The potential for cumulative effects was also considered. Cumulative effects can arise from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Ecological features may already be exposed to pressure and further impact could cause irreversible decline (CIEEM, 2018). Developments within 10km of the proposed

development were identified as this is considered to be the maximum zone of influence for ecological receptors. In line with CIEEM guidance, the following development types were included:

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

Significant Effects

8.19 For the purposes of EcIA, the CIEEM guidelines define a significant effect as "*an effect that either supports or undermines biodiversity conservation objectives for important ecological features or for biodiversity in general*". Significant effects can be either positive or negative and are qualified with reference to an appropriate geographic scale, from international to local, however, it should be noted that the scale of significance of an effect may not be the same as the geographic context in which the feature is considered important. For example, an effect on a species which appears on a national list of species of principal importance for biodiversity may not have an effect on its national population.

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

Mitigation, Compensation and Enhancement

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

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

Assessment Areas

8.22 The assessment area for vegetation has been defined here as an area which extends 250m from borrow pits or structures requiring foundations and 100m out from all infrastructure, i.e. areas which are considered to be potentially impacted upon by the development footprint. These distances are based on guidance by SEPA (2017), with respect to the suggested buffers in which GWDTE should be identified. The vegetation assessment area will hereafter be referred to as the Infrastructure Buffers and is shown on **Figures 8.2** and **8.3**.

8.23 The faunal surveys cover a wider area, so impacts have been assessed within the zone of impact appropriate for each receptor.

APPROACH AND METHODOLOGY

Desk Study

8.24 An ecological desk study was undertaken to identify nature conservation designations and records of protected or otherwise notable species in the local area. Only those features that relate to non-avian ecology are considered in this chapter, with bird data being presented in **Chapter 9: Ornithology**.

8.25 The desk study identified designated nature conservation sites such as SACs, SSSIs and NNRs within 5km of the proposed development, extending to 10km for nature conservation sites that are designated (in whole or in part) for aquatic migratory species and which are hydrologically connected with the proposed development site. The desk study also collated records of protected or otherwise notable species from within the last 15 years and within 5km of the proposed development site, although, in the case of bats, this was extended to 10km.

Extended Phase 1 Habitat Survey

8.26 As detailed in **Technical Appendix 8.1**, in September / October 2020 and July / November 2021, an extended Phase 1 habitat survey was undertaken that covered the site plus a 250m buffer, although it should be noted that the subsequent impact assessment considered only the Infrastructure Buffers (see paragraph 8.22). The survey was carried out in accordance with standard Joint Nature Conservation Committee (JNCC) methodology (JNCC, 2010) and involved mapping all habitats, describing plant communities and notable features and assessing the potential for the application site to support protected or otherwise notable species.

8.27 The survey was undertaken at what is considered to be the optimal time of year. Vegetation boundaries were clearly and readily identifiable, together with the dominating floral species of each habitat type. No significant survey limitations were identified.

National Vegetation Classification Survey

8.28 As detailed in **Technical Appendix 8.1**, the NVC survey was carried out during September / October 2020 and July / November 2021, and covered the same survey area as the extended Phase 1 habitat

survey. The work was carried out in accordance with the standard classification of UK vegetation (Rodwell, 1991 *et seq.*).

8.29 Following the NVC survey, potential GWDTE among the recorded NVC communities were classified in terms of their likely high, moderate or low groundwater dependence, based on SEPA guidance (SEPA, 2017).

8.30 The field survey work was undertaken in mid to late season, meaning that early spring / summer flowering plants may have been recorded as absent from the survey area, however, boundaries between vegetation community types were clearly identifiable and no significant limitations in terms of survey timing or weather conditions were identified.

Bat Survey

8.31 As detailed in **Technical Appendix 8.2**, bat surveys were carried out between May and October 2021 in accordance with current survey guidelines (SNH *et al.*, 2019). Survey effort commensurate with a low risk site was considered to be appropriate based on a review of habitat features present.

8.32 The surveys comprised the following (see **Technical Appendix 8.2** for further details):

- habitat assessment – a walkover assessment of the survey area, guided by a review of aerial imagery was undertaken on two separate dates in September and October 2020; and
- three seasonal (spring, summer and autumn), ground level automated surveys were carried out. A total of 12 static detectors were deployed at positions chosen to represent likely wind turbine positions.

8.33 A number of survey limitations were experienced including early failure of some static detectors, and movement of turbine positions during the design process. Although limitations exist, it is considered that the data obtained provides a clear picture of bat activity across the site and wider environs, and as a result it is not anticipated the limitations affect the results to a significant degree.

Protected Species Survey

8.34 As detailed in **Technical Appendix 8.3**, surveys for protected species were undertaken during September / October 2020 and July / September / November 2021. Target species were considered to be otter *Lutra lutra*, water vole *Arvicola amphibius*, badger *Meles meles*, wild cat *Felis silvestris* and pine marten *Martes martes*, and the study area was defined as the site plus a 250m buffer.

8.35 The otter survey followed standard methodologies (Purseglove, 1995; Chanin, 2003; Bang and Dahlstrøm, 2006; Muir and Morris, 2013). The water vole survey was conducted with reference to Strachan and Moorhouse (2012). The badger survey was carried out in accordance with the methodology described in SNH (2003). The pine marten and red squirrel *Sciurus vulgaris* surveys followed the methods described in Cresswell *et al.* (2012). However, any evidence of other species of conservation interest was also noted.

8.36 Surveys were undertaken at an appropriate time of year and under suitable weather conditions in accordance with the standard methodologies described above. No significant limitations were identified.

Aquatic Walkover Survey

8.37 As detailed in **Technical Appendix 8.4**, a walkover survey was undertaken in order to assess the importance of watercourses on site for fish. All watercourses draining the site were visited and photographed and their suitability for migratory fish assessed along with their connectivity to significant watercourses in the wider environs such as the Halladale River.

8.38 The walkover survey was undertaken following a period of heavy rainfall and flows were considered to be elevated however, this was not considered to be a significant limitation in terms of the aim of assessing the suitability of watercourses for fish.

BASELINE CONDITIONS

Consideration of other Development Projects

8.39 The results of ecological surveys are presented within **Technical Appendices 8.1 – 8.4**. This section identifies relevant ecological receptors found on site and in the vicinity of the site, and assesses their value in the context of the proposed development.

8.40 CIEEM EcIA guidelines (CIEEM, 2018) require that consideration is given to other development projects when predicting the baseline. The reason for this is that other development projects, which are consented, recently constructed or which are considered to have an ongoing operational effect, may influence the baseline and this should be taken into account.

8.41 One operational wind farm development, Strathy North Wind Farm, was identified within 10km of the site (c. 4.47km to the south west at its closest point). Other development projects are at various stages of the planning system and are discussed in paragraphs 8.157 to 8.167. Planning permission for Strathy North was granted in 2011 and the site became operational in 2015. The development was subject to EIA, however, no information pertaining to protected species was available for review.

8.42 The 33 turbines installed at Strathy North Wind Farm are located within an area of commercial coniferous plantation (Strathy Forest) that was felled for the development. Review of aerial photography appears to show a number of narrow burns flowing east and north into the River Strathy where it would appear more suitable habitat for otter is located.

8.43 Two other developments are located in this area, to the south of Strathy North Wind Farm: Strathy Wood and Strathy South Wind Farms. EIA documents were available for review for both projects via THC's online planning portal and recorded otter activity on the River Strathy, the watercourses Allt nan Clach and Allt Badain, and Loch nan Clach.

8.44 As major earthworks to watercourses and lochans in this area as part of the proposals at Strathy Wood and Strathy South Wind Farms are considered unlikely, and given the separation distance from Strathy North Wind Farm and the River Strathy, significant impacts on otter are considered unlikely.

8.45 While the construction of Strathy North Wind Farm has resulted in the felling of an area of commercial conifer plantation, survey information obtained from EIA documents for Strathy Wood

and Strathy South Wind Farms recorded very limited use of this habitat by low numbers of foraging and commuting bat species (predominantly common pipistrelle *Pipistrellus pipistrellus*, with occasional soprano pipistrelle *Pipistrellus pygmaeus* and *Myotis* sp.) along woodland edge habitat. Therefore, significant impacts on bats are considered unlikely.

8.46 It is not considered likely that the operational Strathy North Wind Farm is significantly influencing the proposed development baseline.

Nature Conservation Sites

8.47 There are six sites designated for non-avian nature conservation interests within 5km of the site (**Figure 8.1** refers):

- Caithness and Sutherland Peatlands SAC / Ramsar;
- West Halladale SSSI;
- East Halladale SSSI;
- Strathy Coast SSSI; and
- Red Point Coast SSSI.

8.48 **Caithness and Sutherland Peatlands SAC / Ramsar** is immediately adjacent to the west of the proposed development. The boundary of the proposed development does overlap slightly in the north west of the site. This is to incorporate the entirety of the forestry block, as this area will be the subject of peatland restoration proposals as part of a Habitat Management Plan (**TA 8.5: Draft Habitat Management Plan**). This SAC / Ramsar is one of the largest and most intact areas of blanket bog in the world covering an area greater than 140,000ha and includes several hundred freshwater lochs. The qualifying interests include extensive blanket bogs, depression on peat substrates, numerous lochs and lochans supporting a good population of otter, acid peat-stained lakes and ponds, wet heathland with cross-leaved heath *Erica tetralix*, clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels, marsh saxifrage *Saxifraga hirculus*, and transition mires and quaking bogs.

8.49 **West Halladale SSSI** is immediately adjacent to the west of the proposed development. The boundary of the proposed development does overlap slightly in the north west of the site. This is to incorporate the entirety of the forestry block, as this area will be the subject of peatland restoration proposals as part of a Habitat Management Plan (**TA 8.5: Draft Habitat Management Plan**). The SSSI forms part of one of the most extensive areas of blanket bog in the world and supports internationally important populations of upland birds and otters. Local to the proposed development, the SSSI is a patchwork of blanket bog, wet heath and open water in a landscape of rocky ridges. Well-developed pool systems including areas with large numbers of dubh lochans occur throughout the SSSI and some contain areas of nationally rare quaking mire, and support populations of cowberry *Vaccinium vitis-idaea* and dwarf birch *Betula nana*.

8.50 **East Halladale SSSI** is located approximately 1.50km to the east of the proposed development at its closest point. The SSSI is internationally important for blanket bog, breeding bird assemblage including dunlin *Calidris alpina* and golden plover *Pluvialis apricaria*, and otter. Deergrass

Trichophorum germanicum, heather *Calluna vulgaris* and common cotton-grass *Eriophorum angustifolium* dominate the vegetation of the SSSI, with purple moor-grass *Molinia caerulea* and hare's-tail cotton-grass *Eriophorum vaginatum* also abundant in certain areas. *Sphagnum* bog-mosses form dense carpets in some places. Two nationally scarce plant species occur on site, cranberry *Vaccinium oxycoccos* and dwarf birch.

8.51 **Strathy Coast SSSI** is located approximately 2.69km to the north east of the proposed development at its closest point. The SSSI covers a section of the north Sutherland coast centred around Strathy Point, some 7km to the east of Bettyhill. It comprises north, east and west facing cliffs, interrupted by beach systems at Armadale, Strathy and Melvich. The SSSI is notified for the nationally important maritime cliff, sand dune, machair and salt marsh habitats found along the coast and for the assemblage of rare plants. It is also notified for the Moine rocks around Portskerra.

8.52 **Red Point Coast SSSI** is located approximately 4.55km to the north east of the proposed development at its closest point. The SSSI is a 6km stretch of coastline between Sandside Bay in Caithness and Melvich Bay in Sutherland. The SSSI has been designated for the nationally important geology, coastal vegetation and breeding seabirds. The SSSI contains two geological features: ancient lake margin sediments from the Middle Devonian (around 390 million years ago) and Quaternary sediments deposited by Ice Age glaciers (around 22,000 years ago). The cliff-top vegetation includes large colonies of Scottish primrose *Primula scotica* and the cliffs themselves support colonies of breeding seabirds.

Evaluation of Designated Sites

8.53 Designated sites considered relevant to non-avian ecology are evaluated in **Table 8-3**.

Table 8-3: Evaluation of Designated Sites

Designated Site	Reason for Evaluation	Evaluation
Caithness and Sutherland Peatlands SAC / Ramsar	The designation of this site as both a SAC and Ramsar recognises it is of international value	International
West Halladale SSSI	The designation of this site as a SSSI recognises it is of national value	National
East Halladale SSSI	The designation of this site as a SSSI recognises it is of national value	National
Strathy Coast SSSI	The designation of this site as a SSSI recognises it is of national value	National
Red Point Coast SSSI	The designation of this site as a SSSI recognises it is of national value	National

Habitats

Overview

8.54 Phase 1 habitats are presented on **Figure 8.2** and NVC communities are presented on **Figure 8.3**. The site boundary, proposed infrastructure layout, and associated infrastructure buffers have been superimposed onto both Figures. Phase 1 habitats and NVC communities recorded as present within the Infrastructure Buffers are listed, together with their extent, in **Table 8-4** and **Table 8-5** respectively.

Table 8-4: Phase 1 Habitats Recorded Within Infrastructure Buffers

Phase 1 Habitat	Extent (ha) within Infrastructure Buffers (% of total)
Semi-improved acid grassland	0.39 (0.14)
Blanket *Sphagnum* bog	96.08 (33.16)
Continuous bracken *Pteridium aquilinum*	6.69 (2.31)
Broad-leaved plantation woodland	2.99 (1.03)
Semi-natural broad-leaved woodland	2.86 (0.99)
Coniferous plantation woodland	19.39 (6.69)
Acid dry dwarf shrub heath	6.41 (2.21)
Flush and spring – acid / neutral flush	3.48 (1.20)
Improved grassland	13.29 (4.58)
Marsh / marshy grassland	29.22 (10.08)
Scattered broad-leaved trees	1.33 (0.46)
Gorse *Ulex europaeus* scrub	0.49 (0.17)
Wet dwarf shrub heath	52.36 (18.07)
Mosaics	
Semi-improved acid grassland / continuous bracken	2.03 (0.70)
Semi-improved acid grassland / flush and spring – acid/neutral flush	14.60 (5.04)
Semi-improved acid grassland / wet dwarf shrub heath	6.40 (2.21)
Acid dry dwarf shrub heath / continuous bracken	2.40 (0.83)

Flush and spring – acid/neutral flush / broad-leaved plantation woodland	0.06 (0.02)
Flush and spring – acid/neutral flush / acid dry dwarf shrub heath / continuous bracken	3.15 (1.09)
Marsh/marshy grassland / semi-improved acid grassland	4.77 (1.65)
Marsh/marshy grassland / wet dwarf shrub heath	4.78 (1.65)
Marsh/marshy grassland / continuous bracken	0.65 (0.23)
Wet dwarf shrub heath / blanket *sphagnum* bog	3.00 (1.04)
Wet dwarf shrub heath / acid dry dwarf shrub heath	1.54 (0.53)
Wet dwarf shrub heath / marsh/marshy grassland	11.40 (3.94)
Total	**289.79 (100%)**

Table 8-5: NVC Communities Recorded Within Infrastructure Buffers

NVC Community	Extent (ha) within Infrastructure Buffers (% of total)
Discrete stands of classifiable NVC communities	
M6 *Carex echinata – Sphagnum fallax / denticulatum* mire, sub-community a	0.48 (0.17)
M6 *Carex echinata – Sphagnum fallax / denticulatum* mire, sub-community c	0.33 (0.11)
M15 *Trichophorum germanicum – Erica tetralix* wet heath	23.00 (7.94)
M15 *Trichophorum germanicum – Erica tetralix* wet heath, sub-community b	5.36 (1.85)
M17 *Trichophorum germanicum – Eriophorum vaginatum* blanket mire	3.13 (1.08)
M17 *Trichophorum germanicum – Eriophorum vaginatum* blanket mire, sub-community b	38.68 (13.35)
M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire	2.98 (1.03)
M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire, sub-community a	4.94 (1.70)
M23 *Juncus effusus / acutiflorus – Galium palustre* rush-pasture	0.47 (0.16)

MG6 *Lolium perenne – Cynosurus cristatus* grassland	1.06 (0.37)
U2 *Deschampsia flexuosa* grassland	0.40 (0.14)
U20 *Pteridium aquilinum – Galium saxatile* community	3.96 (1.37)
U20 *Pteridium aquilinum – Galium saxatile* community, sub-community a	2.74 (0.94)
W4 *Betula pubescens – Molinia caerulea* woodland	2.86 (0.98)
W4 *Betula pubescens – Molinia caerulea* woodland, sub-community c	0.85 (0.29)
W17 *Quercus petraea – Betula pubescens – Dicranum majus* woodland	3.26 (1.12)
W23 *Ulex europaeus – Rubus fruticosus* scrub	0.49 (0.17)
Mosaics	
H10 *Calluna vulgaris – Erica cinerea* heath with planted broad-leaved trees	3.95 (1.36)
H10 *Calluna vulgaris – Erica cinerea* heath, sub-community a with planted broad-leaved trees	2.46 (0.85)
H10 *Calluna vulgaris – Erica cinerea* heath / U20 *Pteridium aquilinum – Galium saxatile* community	2.40 (0.83)
M6 *Carex echinata – Sphagnum fallax / denticulatum* mire, mosaic of sub-communities a and b / U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland / H10 *Calluna vulgaris – Erica cinerea* heath	2.67 (0.92)
M6 *Carex echinata – Sphagnum fallax / denticulatum* mire, sub-community c / H10 *Calluna vulgaris – Erica cinerea* heath / U20 *Pteridium aquilinum – Galium saxatile* community	3.15 (1.09)
M6 *Carex echinata – Sphagnum fallax / denticulatum* mire, sub-community c / W4 *Betula pubescens – Molinia caerulea* woodland	0.06 (0.02)
M15 *Trichophorum germanicum – Erica tetralix* wet heath / *Juncus* pasture	16.18 (5.58)
M15 *Trichophorum germanicum – Erica tetralix* wet heath / H10 *Calluna vulgaris – Erica cinerea* heath	1.54 (0.53)
M15 *Trichophorum germanicum – Erica tetralix* wet heath / U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland	12.88 (4.44)
M15 *Trichophorum germanicum – Erica tetralix* wet heath / M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire	3.47 (1.20)
M17 *Trichophorum germanicum – Eriophorum vaginatum* blanket mire, mosaic of sub-communities a and b	57.01 (19.67)

M23 *Juncus effusus / acutiflorus – Galium palustre* rush-pasture / U20 *Pteridium aquilinum – Galium saxatile* community	0.65 (0.23)
M28 *Iris pseudacorus – Filipendula ulmaria* mire / U20 *Pteridium aquilinum – Galium saxatile* community	0.89 (0.31)
U2 *Deschampsia flexuosa* grassland / M6c *Carex echinata – Sphagnum fallax / denticulatum* mire, sub-community c	14.60 (5.04)
U2 *Deschampsia flexuosa* grassland / M15 *Trichophorum germanicum – Erica tetralix* wet heath	6.40 (2.21)
U2 *Deschampsia flexuosa* grassland / U20 *Pteridium aquilinum – Galium saxatile* community	2.03 (0.70)
U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland / *Juncus* pasture	3.88 (1.34)
Unclassified habitat	
Improved grassland	11.68 (4.03)
***Juncus* pasture**	27.68 (9.55)
Low woodland	1.39 (0.48)
Mixed woodland	1.33 (0.46)
Coniferous plantation woodland	16.89 (5.83)
Pasture	1.60 (0.55)
Total	**289.79 (100%)**

8.55 The habitats and NVC communities are briefly described below, with full details provided in **Technical Appendix 8.1**. For ease of reading, habitats and NVC communities are described below under Phase 1 habitat headings. It should be noted that there is not always a direct correspondence between the two types of classification because individual Phase 1 habitat types can include a number of different NVC community types, and some NVC communities can occur in different Phase 1 habitat types. Scientific names for plant species are provided in **Technical Appendix 8.1** and only used below where a species has no commonly accepted English name (this notably applies to some lower plants). Habitats present at very low abundance (< 0.1ha) are not described below.

Wet Heath

8.56 Wet heath community M15 is the dominant community in the east of the site on gently sloping ground and accounts for approximately 52.36ha, with a further 40.47ha present in mosaics with *Juncus* pasture, H10 heath, U2 and U4 grassland, and M19 blanket mire.

Heath

8.57 Dry heath community H10 is present on the steeper, drier slopes along the Allt na h-Eaglaise burn and in the north of the survey area in mosaic with M6 mire, U20 community, U4 grassland, M15 wet heath and planted deciduous trees, accounting for approximately 16.19ha.

Blanket Mire

8.58 Blanket mire community M17 is the dominant community in the west and south of the site on generally flat ground and accounts for approximately 98.82ha. Other blanket mire communities present are M6 (accounting for approximately 0.81ha), M19 (accounting for approximately 7.91ha) and M23 (accounting for approximately 0.47ha).

8.59 M6 is also present in mosaic with U4 grassland and H10 heath (2.67ha), and H10 heath and U20 community (3.15ha). M19 is also present in mosaic with M15 wet heath (3.47ha) and M23 is also present in mosaic with U20 community (0.65ha). M28 mire is also present in mosaic with U20 community (0.89ha).

Mesotrophic Grassland

8.60 Mesotrophic grasslands are grassland habitats with an intermediate level of nutrients and are considered relatively productive in terms of flora. At the application site, this type of habitat is generally unclassified at NVC scale due to the intensification of agriculture limiting the species diversity of the sward and is present in the north of the site around the site entrance in the form of improved grassland (11.69ha) and *Juncus*-dominated pasture (27.68ha). *Juncus* pasture is also present in mosaic with M15 wet heath and U4 grassland (20.06ha).

8.61 Two abnormal load turning areas are proposed (although only one would need to be constructed), both sited immediately adjacent to the A836. The turning area to the north west of the main site (Turning Area A), adjacent to the building at Strathroy, supports a field of pasture (1.60ha). The turning area to the north of the main site (Turning Area B) is located at the western edge of Melvich and currently supports an MG6 grassland habitat (1.06ha).

Acid Grassland

8.62 This habitat is only present as small patches within the Infrastructure Buffers. U2 grassland is present as a discrete stand in the upper reaches of the corridor of the southern tributary to the Allt na h-Eaglaise watercourse (0.40ha). U2 grassland is also present in mosaic with M6 mire (14.60ha), M15 wet heath (6.40ha) and U20 community (2.03ha).

8.63 U4 grassland is present in a mosaic with *Juncus* pasture (3.88ha), and M6 mire and H10 heath (2.67ha) in the north of the site around the access route, and with M15 wet heath (12.88ha) in the east of the site.

8.64 U20 community and sub-community a were identified as discrete stands in the north of the site, along the corridor of the Allt na h-Eaglaise, and in the east adjacent to the lower reaches of the Allt nan Gall (6.69ha). It is also present in mosaic with H10 heath (2.40ha), M23 rush-pasture (0.65ha), M28 mire (0.89ha), M6 mire and H10 heath (3.15ha), and U2 grassland (2.03ha).

Woodland

8.65 A small element of planted deciduous woodland is present within the Infrastructure Buffers in the north of the site around the northern tributary of the Allt na h-Eaglaise, and most closely aligns with W4 type (3.71ha).

8.66 Along the lower reaches of this watercourse, the W4 grades into W17 woodland (3.26ha). To the north of the site entrance, there is a small area of W23 scrub woodland (0.49ha).

Watercourses

8.67 The north of the site is roughly split into east and west sectors by the burn Allt na h-Eaglaise and its tributaries which flow east then north, merging with field drainage ditches before joining the Halladale River to the south of the Halladale Bridge.

8.68 The south of the site is split by the burns Allt nan Gall and Allt an Tigh-choinneimh that drain east into the Halladale River at Achiemore Pool.

Evaluation of Habitats and Plant Communities

8.69 **Table 8-6** shows the potential groundwater dependence (from SEPA, 2017) and nature conservation status for NVC categories identified (or Phase 1 habitats where NVC categorisation is absent) within the Infrastructure Buffers.

Table 8-6: Potential Groundwater Dependence and Nature Conservation Designations of Phase 1 Habitats / NVC communities within the Infrastructure Buffers

Phase 1 Habitat / NVC Community	Potential Groundwater Dependence	Nature Conservation Status
H10 *Calluna vulgaris – Erica cinerea* heath	None	European dry heaths (Annex 1) Alpine and Boreal heaths (Annex 1) Upland heathland (SBL)
M6 *Carex echinata – Sphagnum fallax / denticulatum* mire	High	Upland flushes, fens and swamps (SBL)
M15 *Trichophorum germanicum – Erica tetralix* wet heath	Moderate (dependent on the hydrogeological setting)	Northern Atlantic wet heaths with *Erica tetralix* (Annex 1) Alpine and boreal heaths (Annex 1) Degraded raised bogs still capable of natural regeneration (Annex 1) Blanket bogs (Annex 1) Blanket bog (SBL)

		Upland flushes, fens and swamps (SBL) Upland heathland (SBL)
M17 *Trichophorum germanicum – Eriophorum vaginatum* blanket mire	None	Blanket bogs (Annex 1) Depressions on peat substrates of the *Rhynchosporion* (Annex 1) Blanket bog (SBL) Upland heathland (SBL)
M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire	None	Active raised bogs (Annex 1) Blanket bogs (Annex 1) Depressions on peat substrates of the *Rhynchosporion* (Annex 1) Blanket bog (SBL) Upland heathland (SBL)
M23 *Juncus effusus / acutiflorus – Galium palustre* rush-pasture	High	Purple moor-grass and rush pastures (SBL) Upland flushes, fens and swamps (SBL)
M28 *Iris pseudacorus – Filipendula ulmaria* mire	Moderate (dependent on the hydrogeological setting)	Blanket bog (SBL) Upland flushes, fens and swamps (SBL)
U2 *Deschampsia flexuosa* grassland	None	Upland flushes, fens and swamps (SBL) Upland heathland (SBL) *Juncus squarrosus – Festuca ovina* grassland (SBL) *Nardus stricta – Galium saxatile* grassland (SBL)
U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland	None	Species-rich *Nardus* grassland on siliceous substrates in mountain areas (Annex 1) Upland heathland (SBL) *Juncus squarrosus – Festuca ovina* grassland (SBL) *Nardus stricta – Galium saxatile* grassland (SBL)
U20 *Pteridium aquilinum – Galium saxatile* community	None	

MG6 *Lolium perenne* – *Cynosurus cristatus* grassland	None	
W4 *Betula pubescens / Molinia caerulea* woodland	High	Caledonian forest (Annex 1) Bog woodland (Annex 1) Upland birchwoods (SBL) Wet woodland (SBL)
W17 *Quercus petraea – Betula pubescens – Dicranum majus* woodland	None	Old sessile oakwoods (Annex 1) Caledonian forest (Annex 1) Upland birchwoods (SBL) Wet woodland (SBL)
W23 *Ulex europaeus – Rubus fruticosus* scrub	None	
Coniferous plantation woodland	None	
Deciduous low woodland	None	
Mixed woodland	None	
Improved grassland	None	
***Juncus* pasture**	None	Purple moor-grass and rush pastures (SBL)

Definitions:

Annex 1 - Annex 1 of the European Union Habitats Directive (92/43/EEC)

SBL - Scottish Biodiversity List

8.70 **Table 8-7** shows the value given for each habitat identified within the Infrastructure Buffers. Wherever possible, the NVC categories have been used as the basis of the evaluation because they more directly relate to the SEPA (2017) GWDTE classification as well as Annex 1 and SBL habitat categories.

Table 8-7: Evaluation of Habitats / NVC Communities within the Infrastructure Buffers

Phase 1 Habitat / NVC Community	Reason for Evaluation	Evaluation
H10 *Calluna vulgaris – Erica cinerea* heath	Listed on the SBL, with floristic variations listed on Annex 1. Low level of cover within the Infrastructure Buffers in mosaic with planted deciduous trees, U20, M15, M6 and U4, and M6 and U20 at 5.59%.	Less than local
M6 *Carex echinata – Sphagnum fallax / denticulatum* mire	Listed on the SBL. Very low level of cover within the Infrastructure Buffers as a discrete stand (0.28%). Also present in mosaic with U4 and H10, H10 and U20, W4, and U2 equating to 7.07%. High potential for groundwater dependence.	Local
M15 *Trichophorum germanicum – Erica tetralix* wet heath	Listed on the SBL, with floristic variations listed on Annex 1. Moderate level of cover within the Infrastructure Buffers as a discrete stand at 9.79%, with additional coverage as a mosaic with *Juncus* pasture, H10, U4, M19, and U2 (13.96%). Moderate potential for groundwater dependence.	Local
M17 *Trichophorum germanicum – Eriophorum vaginatum* blanket mire	Listed on the SBL, with floristic variations listed on Annex 1. Moderate level of cover within Infrastructure Buffers at 34.10%.	Local
M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire	Listed on the SBL, with floristic variations listed on Annex 1. Low level of cover within Infrastructure Buffers as a discrete stand (2.73%), and in mosaic with M15 (1.20%).	Less than local
M23 *Juncus effusus / acutiflorus – Galium palustre* rush-pasture	Listed on the SBL. Very low level of cover within the Infrastructure Buffers as a discrete stand (0.16%), and in mosaic with U20 (0.23%). High potential for groundwater dependence.	Less than local
M28 *Iris pseudacorus – Filipendula ulmaria* mire	Listed on the SBL. Very low level of cover within the Infrastructure Buffers in mosaic with U20 at 0.31%. Moderate potential for groundwater dependence.	Less than local
U2 *Deschampsia flexuosa* grassland	Listed on the SBL. Very low level of cover within the Infrastructure Buffers as a discrete stand (0.14%), and in mosaic with M15, M6, and U20 (7.95%).	Less than local
U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland	Listed on the SBL. Low level of cover within the Infrastructure Buffers in mosaic with *Juncus* pasture, M15, and M6 and H10 (6.71%).	Less than local
U20 *Pteridium aquilinum – Galium saxatile* community	Low level of cover within the Infrastructure Buffers as a discrete stand (2.31%), and in mosaic with H10, M23, M28, M6 and H10, and U2 (3.15%).	Less than local

MG6 *Lolium perenne – Cynosurus cristatus* grassland	Very low level of cover within the Infrastructure Buffers at 0.37%.	Less than local
W4 *Betula pubescens / Molinia caerulea* woodland	Listed on the SBL, with floristic variations listed on Annex 1. Very low level of cover within the Infrastructure Buffers as a discrete stand (1.28%), and in mosaic with M6 (0.02%). High potential for groundwater dependence.	Less than local
W17 *Quercus petraea – Betula pubescens – Dicranum majus* woodland	Listed on the SBL, with floristic variations listed on Annex 1. Very low level of cover within the Infrastructure Buffers at 1.12%.	Less than local
W23 *Ulex europaeus – Rubus fruticosus* scrub	Very low level of cover within the Infrastructure Buffers at 0.17%.	Less than local
Coniferous plantation woodland	Low level of cover within the Infrastructure Buffers at 5.83%.	Less than local
Deciduous low woodland	Very low level of cover within the Infrastructure Buffers at 0.48%.	Less than local
Mixed woodland	Very low level of cover within the Infrastructure Buffers at 0.46%.	Less than local
Improved grassland	Low level of cover within the Infrastructure Buffers at 4.03%.	Less than local
***Juncus* pasture**	Listed on the SBL. Moderate level of cover within Infrastructure Buffers as a discrete stand (10.10%), and in mosaic with M15 and U4 (6.92%).	Less than local

Fauna

Existing Species Records

8.71 **Table 8-8** shows a summary of records for legally protected or otherwise notable species within 5km (or 10km for bats) of the site from the last 15 years.

Table 8-8: Summary of Desk Study Species Records up to 2km from the Site (10km for Bats)

Species	Data Source	Summary of Records
Mammals		
European otter *Lutra lutra*	Highland Biological Recording Group (HBRG) Records of Otters from Site Condition Monitoring in Scotland 2011-2012 (CC-BY and OGL Licences)	13 records (12 from 2011, 1 from 2008) with no records from within the site boundary, the nearest record being recorded approximately 0.86km to the east in the vicinity of Achiemore Pool.

Wildcat *Felis silvestris*	HBRG (CC-BY Licence)	1 record from 2010 recorded beyond the site boundary, approximately 0.86km to the east in the vicinity of Achiemore Pool.
Badger *Meles meles*	HBRG (CC-BY Licence)	1 record from 2010 recorded beyond the site boundary, approximately 3.01km to the east south east, south of Loch na Seilge
Herptiles		
Common lizard *Zootoca vivipara*	HBRG (CC-BY Licence)	1 record from 2010 from within the site boundary

8.72 A summary of the protected or otherwise notable fauna recorded within the study area during the various ecological surveys and / or the potential for protected / notable faunal species to be present is provided below.

Otter

8.73 Otters are largely solitary, semi-aquatic mammals which feed mainly on fish but also on amphibians (especially in winter and spring), small mammals or birds. Otters are listed as a priority species in the UK Biodiversity Action Plan (BAP) (JNCC, 1994) and are also listed on the Scottish Biodiversity List as a species of importance for the purpose of conservation of biodiversity in Scotland. As a European Protected Species (EPS) under the Habitats Directive, otters and their resting places are afforded a high level of legal protection.

8.74 As detailed in **Technical Appendix 8.3**, otter spraints and feeding signs in the form of predated fish were identified at points along the lower reaches of the Allt na h-Eaglaise watercourse, outwith the site boundary. No resting places were discovered within the study area.

8.75 Although no direct evidence of otter was found within the site and only in the survey buffer, it is possible that otters could forage along the length of all tributaries which connect the site to the Halladale River.

Wildcat

8.76 No evidence of this species was found during field survey. The species is in significant decline and this is not recognised as a priority area for wildcat. This species is considered to be **absent** from the Study Area.

Bats

8.77 As detailed in **Technical Appendix 8.2**, bat surveys were undertaken in line with current guidance (SNH *et al.*, 2019) during the bat activity season of 2021 across the site and adjacent habitats.

8.78 Habitat assessments confirmed that the site is considered to be of low value for commuting and foraging bats. Optimal bat habitat was, however, located along the Halladale River outwith the site

to the east. The river is generally a wide, meandering river with a number of scattered pools along its length. This provides sheltered foraging habitat for specialist aquatic foragers such as Daubenton's *Myotis daubentonii* as well as more generalist species such as pipistrelles *Pipistrellus* sp. Adjacent habitat along the river's corridor is generally agricultural fields with scattered farms and houses providing potential roosting and foraging habitat.

8.79 The wider environs can generally be split into the lowland coastal strip to the north along the A836, with rivers such as the Halladale River extending inland with relatively intensive agricultural fields immediately adjacent. To the south and west of the site the landscapes are dominated by open upland habitats forming the characteristic Flow Country.

8.80 The northern latitude and generally open habitats of low suitability result in local bat populations generally being at low density with low species diversity.

8.81 Static detector surveys resulted in very low activity levels across the site with a total of 91 common pipistrelle *Pipistrellus pipistrellus* bat passes across all detectors over three deployment occasions. No other species were identified.

8.82 Common pipistrelle are considered to be species of medium risk from wind turbine mortality. However, based upon these results, it is concluded that the frequency of use of the site and specifically the turbine envelope is low enough that the risk of killing and injury of bats from the wind turbines is very low. This risk is further reduced due to the open nature of the site and lack of features such as mature deciduous woodland.

Pine Marten

8.83 Farm buildings in the wider area may provide some suitable denning structures for pine marten, however, no existing records were identified within 5km and no field evidence of this species was found during survey. This species is considered **absent** from the Study Area.

Water Vole

8.84 Although suitable habitat was present on site (especially along the Allt na h-Eaglaise and Allt nan Gall watercourses and supporting tributaries), no evidence of this species was recorded during the survey and this species is considered to be **absent** from the study area.

Badger

8.85 Badgers are opportunistic omnivores, taking whichever food happens to be most profitable at the time (Woods, 2010). In Britain, the primary food source for badgers is considered to be earthworms, however, insects, mammals, birds and fruit are also key dietary components depending on availability. Habitats within the study area are upland in nature, comprising primarily heaths and mire, with scattered patches of grassland. These habitats are unlikely to be highly productive for earthworms due to the acidity of soils and so are considered unlikely to provide valued foraging resource for badgers. While there are historical records of this species identified within 5km of the site, no field evidence of badgers was found, and therefore this species is considered **absent** from the study area.

Aquatic Fauna

8.86 There are four main watercourses within the study area, and from south to north are:

- Allt an Tigh-Choinneimh;
- Allt nan Gall;
- Allt na h-Eaglaise; and
- Unnamed watercourse at Kirkton Farm.

8.87 All are tributaries of the River Halladale.

8.88 The un-named tributary and Allt na h-Eaglaise flow into a heavily canalised section which is approximately 2-3m wide. Fish were noted jumping during the November 2021 survey and predated salmon kelts were noted on the river bank, suggesting this watercourse has important spawning habitat (concealed by the high flows at the time of survey). The un-named tributary was considered to offer low quality fish habitat throughout its length due to various flow constrictions and the likely ephemeral nature of parts of the channel. The Allt na h-Eaglaise however, offered high quality fish habitat from the confluence with the Halladale River to lower-mid section within the main proposed wind farm site. Above this point the habitat was still considered good; however, the steeper gradient is likely to limit the usable habitat. The upper section of the southern tributary was considered to offer low quality habitat due to the steep overgrown channel which is likely to be ephemeral in the upper reaches. The majority of the Allt na h-Eaglaise is 2-3m wide and up to 30cm deep, forming long run sections. While bankside vegetation was generally sparse, consisting of gorse and scattered trees, the macro-invertebrate sample indicates excellent water quality.

8.89 The Allt nan Gall is approximately 2-3m wide and up to 30cm deep, reducing to approximately 1m wide in the upper reaches. The bankside vegetation varied from areas with tree / shrub cover to bare banks. The upper and lower sections were considered to offer high quality fish habitat while the steeper faster flowing mid-section provided good habitat.

8.90 Allt an Tigh-Choinneimh was generally 1-2m wide and 20-30cm deep, offering high quality fish habitat up to the gorge section. Above this point habitat was considered to be low quality, although usable habitat was still present. Bankside vegetation and tree cover was generally limited although more prevalent in the gorge section where grazing was limited.

Herptiles

8.91 The site contains dry and wet habitats, varied vegetation structure, open areas and ecotones, and is considered generally suitable for a variety of reptile and amphibian species. There is a solitary historical record of common lizard *Zootoca vivipara* within 5km of the site over the past 15 years.

Deer

8.92 The proposed development site lies within the Northern Deer Management Group area. The group covers a large area of Caithness and North Sutherland, much of which is within designated areas and forms a large part of the Caithness and Sutherland Peatlands SAC.

8.93 The majority of the site is a combination of blanket bog and heath. Shelter is limited to a relatively small area of coniferous plantation in the north of the site and very small stands of coniferous plantation in the south. There are areas of recent broad-leaf plantation, however these are immature and deer are excluded by fencing.

8.94 Surrounding the land at Kirkton Farm, Bighouse Estate extends to an approximate 14,754ha on either side of the Halladale River with an approximate equal divide between west and east. The Estate is primarily a sporting estate for salmon fishing, deer stalking and pheasant / partridge shooting. Much of the Estate is under crofting tenure. The bulk of the inbye land runs down Strath Halladale to the property at Trantlebeg and the River Dyke and has been ring-fenced with deer fencing to protect croft land from losses to deer. Common grazings extend over some 90% of the hill land and a number of crofters continue to exercise these rights, putting a fair number of sheep to the hill for much of the year on both sides of the strath, but primarily on the east side.

8.95 The 2021 foot count data for Bighouse Estate (provided by NatureScot), showed 141 stags, 123 hinds and 50 calves across the 7,200ha to the west of the A897, and 38 stags, 119 hinds and 64 calves across the 7,188ha to the east of the A897 – this indicates a density of 4.7 per km^2 in the west and 3.1 per km^2 in the east.

Evaluation of Faunal Receptors

8.96 An evaluation of non-avian faunal receptors which are subject to legal protection or which are otherwise notable (priority species on the SBL and / or LBAP) and which are present within the study area is provided in **Table 8-9**.

Table 8-9: Summary of Desk Study Species Records up to 2km from the Site (10km for Bats)

Species	Legal / Conservation Status	Reason for Evaluation	Evaluation
Otter	Fully protected as a European Protected Species under The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) SBL priority species	Otter spraints and feeding signs found on the lower reaches of the Allt na h-Eaglaise watercourse just beyond the north east boundary of the site. However, no resting places were discovered within the study area. Otter are a qualifying feature of the Caithness and Sutherland Peatlands SAC, an international designation, located immediately adjacent to the west, and hydrologically linked.	International (qualifying feature of the Caithness and Sutherland Peatlands SAC)
Bats	Fully protected as European Protected Species under The Conservation (Natural	No evidence of roosting bats within the study area. Static detector surveys highlighted	Local (common pipistrelle)

	Habitats, &c.) Regulations 1994 (as amended) SBL priority species	very low activity across the site with only 91 flights of common pipistrelle recorded across all detectors over three deployment occasions. Common pipistrelle is considered to be a common species (Wray *et al.*, 2010).	
Aquatic fauna	Atlantic salmon *Salmo salar* in freshwater is listed on Schedule 3 of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), which makes it an offence to use certain methods to catch or take fish. It is also a priority species on the SBL. Brown trout *Salmo trutta* is a SBL priority species. It is partially protected through exploitation controls within fisheries legislation.	The unnamed tributary of the Allt na h-Eaglaise at Kirkton Farm offers low quality fish habitat throughout its length due to various flow constrictions and the likely ephemeral nature of parts of the channel. The Allt na h-Eaglaise offers high quality fish habitat from the confluence with the Halladale River to the lower-mid section within the main proposed development site. Above this point the habitat was still considered good; however, the steeper gradient is likely to limit the usable habitat. The upper section of the southern tributary was considered to offer low quality habitat due to the steep overgrown channel which is likely to be ephemeral in the upper reaches. Bankside vegetation of the Allt nan Gall varied from areas with tree / shrub cover to bare banks. The upper and lower sections were considered to offer high quality fish habitat while the steeper faster flowing mid-section provided good habitat. The Allt an Tigh-Choinneimh offers high quality fish habitat up to the gorge section. Above this point habitat was considered to be low quality,	Less than local

		although usable habitat was still present. Bankside vegetation and tree cover was generally limited although more prevalent in the gorge section where grazing was limited.	
Herptiles	Afforded limited protection under the Wildlife and Countryside Act 1981 (as amended) Adder *Vipera berus* and common lizard SBL priority species	Habitats within the study area are generally suitable for a variety of common reptile and amphibian species.	Less than local
Deer	Afforded limited protection under the Deer (Scotland) Act 1996 (as amended)	The site is marginal within land owned by Kirkton Farm and land in the wider area owned by Bighouse Estate, has poor grazing and few opportunities for shelter.	Less than local

Future Baseline

8.97 If the current land management practices were to continue, the range and condition of habitats currently present is likely to be maintained. Grazing from domestic livestock as well as deer, and the use of artificial drainage especially in the north of the site, together with the planting of deciduous woodland, has modified the vegetation cover through a reduction in bryophyte cover and loss of some typical bog and heath species.

Ecological Features Brought Forward for Assessment

8.98 The following applies to all non-avian ecological receptors brought forward to the detailed ecological impact assessment stage:

- their value is assessed as being important at a local or higher level (and / or they are subject to some form of legal protection); or
- they are habitats classified as highly or moderately dependent GWDTEs; or
- they are potentially vulnerable to significant effects from the proposed development.

8.99 Ecological features meeting those criteria are considered Important Ecological Features (IEFs) and the ecological impact assessment concerns such features only. IEFs include the following:

Habitats:

- M6 Carex echinata – Sphagnum fallax / denticulatum mire;

- M15 Trichophorum germanicum – Erica tetralix wet heath; and
- M17 Trichophorum germanicum – Eriophorum vaginatum blanket mire.

Species:

- Otter; and
- Common pipistrelle.

Designated Sites:

- Caithness and Sutherland Peatlands SAC / Ramsar;
- West Halladale SSSI;
- East Halladale SSSI;
- Strathy Coast SSSI; and
- Red Point Coast SSSI.

IDENTIFICATION AND EVALUATION OF KEY IMPACTS

Mitigation Measures

8.100 In line with current CIEEM guidelines, the impact assessment in this chapter is carried out in the presence of mitigation measures. The following mitigation measures and good practice measures will be applied to the proposed development during construction and operation to ensure that any effects on the IEFs, and site ecology in general, are reduced.

Design Mitigation

8.101 Turbines have been sited at least 50m from watercourses and a distance of at least 50m between turbine blade tip and the nearest woodland has been maintained as per current bat guidance (SNH, 2019).

8.102 A Peat Management Plan (PMP) has been produced (**Technical Appendix 10.2**) which describes measures taken to minimise the amount of peat excavated at the design stage. Measures include siting of turbines and site infrastructure in areas of shallower peat wherever possible and selecting consistent peat depths of 1.0-1.5m as a threshold above which tracks would be floated, where technically feasible.

8.103 The design sought to minimise the take of potential GWDTEs through taking account of NVC information, along with other site constraints, in layout iterations.

Construction Phase

8.104 Full details of construction mitigation measures will be provided in a Construction Environmental Management Plan (CEMP), which will be submitted post-consent to THC for approval in consultation with relevant stakeholders. It is anticipated that this mitigation would be secured as a condition to the deemed planning permission to be granted for the proposed development.

8.105 The PMP (**Technical Appendix 10.2**) describes measures to be taken when excavating peat during construction such as appropriate storage and handling methods. The PMP also describes where peat will be re-used and restoration methods.

General:

- construction works will require a Construction Method Statement (CMS) to be prepared post-determination and in advance of the commencement of works on site; and
- works will be overseen by an Environmental / Ecological Clerk of Works (EnvCoW / ECoW) and their role and responsibilities will be detailed in the CEMP. In outline, this role will include ongoing monitoring of environmental / ecological constraints, review and audit of the appointed contractors environmental performance, delivery of toolbox talks, and supervision of construction works.

Protected Species:

- a pre-construction survey focussing on otter will be undertaken, covering suitable habitat within 250m from construction areas. This survey will be undertaken by a suitably qualified ecologist. The survey will aim to identify if otter activity levels have continued as identified in the baseline surveys. In addition, the surveys will establish if there is a water vole population present within the site given the suitable habitat recorded during baseline surveys and the dynamic nature of water vole populations. The results of the pre-construction surveys will inform whether the CEMP will include further mitigation with regard to protected species. NatureScot will be consulted throughout this process;
- a site speed limit of 15mph will be in place at all times to reduce the risk of collision and protected species mortality associated with construction vehicles;
- excavations will be covered at the end of each working day to minimise the risk of faunal species becoming injured or trapped. Alternatively, a wooden plank or similar means of egress will be placed inside to allow a means of escape for animals should they enter the excavation. Any temporarily exposed open pipe system would be capped in such a way as to prevent wildlife gaining access;
- works will be conducted during daylight hours where possible, avoiding the sensitive periods of dawn and dusk when wildlife is most active;
- to ensure compliance with the Wildlife and Countryside Act 1981, mitigation will be required to reduce the chances of inadvertently killing or injuring individual reptiles during construction works. Given the large spatial scale of the works, fencing and translocation are not considered appropriate. Proposed mitigation therefore involves habitat management and identification

of potential refugia and hibernacula if present. Where appropriate and safe to do so, the vegetation of all construction working areas with potentially suitable open habitats for reptiles will initially be cut during the active season for reptiles (April to October). Taking into account ornithological sensitivities (detailed in **Chapter 9: Ornithology**), October is likely to be the optimal month for this task. Mitigation works will be carried out to reduce the height of vegetation (e.g. use of a brush cutter or tractor mounted flail) and make it less attractive for reptile habitation. The works will be carried out under the supervision of the EnvCoW / ECoW. Working areas would then be kept unsuitable for reptiles through regular cutting until construction in that location commences; and

- In the event that a protected species is discovered on site, all work in that area would stop immediately and the EnvCoW / ECoW contacted. Increased buffer areas may be required in these locations. Details of the local police Wildlife Crime Officer, NatureScot Area Officer, and Scottish Society for the Prevention of Cruelty to Animals (SSPCA) relevant Officer would be held in the site emergency procedure documents.

Habitats:

- the loss of plant communities is an unavoidable consequence of the proposed development. However, incidental habitat loss will be avoided by minimising the footprint of construction activities. This will be achieved by operating machinery and storing materials within the footprint of permanent construction features wherever practicable. This will also be achieved through appropriate training of the site staff and by ensuring that vehicles and their operators do not inadvertently stray onto adjacent habitat areas; and

- re-instatement of habitats – best practice techniques for vegetation and habitat reinstatement will be adopted and implemented on areas subject to disturbance, such as the temporary construction compound area, as soon as is practicable.

Pollution Prevention:

- to prevent pollution of watercourses within, and beyond, the site boundary (with particulate matter or other pollutants such as fuel), best practice techniques will be employed as outlined in **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**. Further details of pollution prevention control measures will be provided in the CEMP. Measures will include:

    - emergency spill kits will be readily available on site to protect against accidental release, leakage or spillage of potentially contaminative substances and materials;
    - construction plant to be checked regularly for leakages and will undergo maintenance on a regular basis;
    - construction traffic to be limited to allocated areas of the proposed development;
    - concrete and cement mixing and washing areas will be sited at appropriate distances from any surface watercourses to limit potential pollution of the water environment;
    - site drainage measures, including drainage ditches and silt traps, will be provided to collect and treat increased surface run off; and
    - assessment of Earthworks Specification, chemical analysis and assessment of imported fill materials.

Operational Phase

8.106 A Habitat Management Plan (HMP) will be established. This has been provided in outline (**Technical Appendix 8.5**), and will be agreed in full with THC and NatureScot before construction commences. It aims to improve the quantity and quality of peatland habitats, benefitting site ecology and ornithology, and to monitor the effects of the proposed development.

8.107 During the operational phase the following mitigation will be in place:

- a site speed limit of 15mph will be in place at all times to reduce the risk of faunal collisions with construction vehicles; and
- a distance of at least 50m between turbine blade tip and the nearest woodland will be maintained as per current bat guidance (SNH, 2019).

8.108 Good practice measures designed to protect the hydrological environment, as outlined in **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** will also benefit the ecology of the site.

Assessment of Construction Phase Impacts

8.109 During construction it is anticipated that the following impacts may arise:

- habitat loss or damage (permanent and temporary);
- possible changes to groundwater flows affecting GWDTEs;
- inadvertent killing or injuring of fauna;
- disturbance to fauna due to vehicular traffic, operating plant and the presence of construction workers; and
- sedimentation or other pollution of watercourses from construction activities and vehicular traffic.

8.110 The potential impacts are addressed for each designated site, habitat or species brought forward to assessment in turn.

Habitats

8.111 **Chapter 3: Description of Development** includes the proposed dimensions of all permanent and temporary features of the proposed development. Permanent features of the proposed development consist of turbines, turbine foundations, crane hardstandings, access tracks, an abnormal load turning area, and substation/battery compound. Temporary features of the proposed development consist of the construction compound and borrow pit(s).

8.112 The impacts are categorised as follows:

- Direct habitat loss: this includes habitats present under the footprint of the proposed development, including access tracks, turbine bases, crane hardstandings, substation, compound and borrow pit(s).

- Indirect habitat disturbance: this has only been calculated for peatland habitats which lie within 5m of the permanent infrastructure. The allowance of 5m is to account for degradation due to drainage and cable laying, and is considered likely to produce a conservative estimate for habitat loss as drainage effects will depend on topology, so not all areas included are likely to be affected.

8.113 The total area of mire (M6 *Carex echinata – Sphagnum fallax / denticulatum* mire), wet dwarf shrub heath (M15 *Trichophorum germanicum – Erica tetralix* wet heath) and blanket bog (M17 *Trichophorum germanicum – Eriophorum vaginatum* blanket mire), habitats assessed as having local or greater value within the Infrastructure Buffers, amounts to approximately 188.95ha (65.20%). This includes 20.48ha (7.07%) of M6 *Carex echinata – Sphagnum fallax / denticulatum* mire which is in mosaic with U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland and H10 *Calluna vulgaris – Erica cinerea* heath, H10 heath and U20 *Pteridium aquilinum – Galium saxatile* community, W4 *Betula pubescens – Molinia caerulea* woodland, and U2 *Deschampsia flexuosa* grassland; and 40.47ha (13.96%) of M15 *Trichophorum germanicum – Erica tetralix* wet heath which is in mosaic with *Juncus* pasture, H10 heath, U4 grassland, M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire, and U2 grassland; and 98.82ha (34.10%) of M17 *Trichophorum germanicum – Eriophorum vaginatum* blanket mire.

M6 *Carex echinata – Sphagnum fallax / denticulatum* mire

8.114 A total of 21.29ha of M6 vegetation communities (including sub-communities) are present within the Infrastructure Buffers, representing 7.35% cover. Almost all of this total (20.48ha) is made up of M6 communities which are in mosaic with U4 grassland and H10 dry heath, H10 dry heath and U20 community, W4 woodland, and U2 grassland, and so this should be regarded as a worst-case scenario.

8.115 A total of 0.44ha (0.12ha of M6a-b/U4/H10 mosaic and 0.32ha of U2/M6c mosaic) will be permanently lost to the proposed development. The loss of 0.15% M6 communities (0.04% M6a-b/U4/H10 mosaic and 0.11% U2/M6c mosaic) within the Infrastructure Buffers leaves 99.85% of this vegetation community (either as a discrete stand and / or in mosaic) still present in the Infrastructure Buffers following construction.

8.116 Ecological effects on M6 communities as a result of direct impacts associated with construction activities are considered to be **non-significant**. Confidence in this prediction is near certain.

8.117 A total of 0.58ha M6 communities (0.24ha of M6a-b/U4/H10 mosaic and 0.34ha of U2/M6c mosaic) are present within 5m of permanent infrastructure, representing 0.20% of the total within the Infrastructure Buffers. Therefore, there is potential for indirect impacts and temporary loss associated with the construction zones around infrastructure. With the mitigation measures detailed above including the requirement for ECoW and the requirement for pollution control during construction (to be taken forward within the proposed development CEMP) along with measures detailed within the PMP (**Technical Appendix 10.2**), effects on M6 vegetation communities as a result of indirect impacts will not result in loss of structure and function.

8.118 Ecological effects on M6 communities as a result of indirect impacts associated with construction activities are considered to be **non-significant**. Confidence in this prediction is near certain.

M15 *Trichophorum germanicum – Erica tetralix* wet heath

8.119 A total of 68.84ha of M15 vegetation communities (including sub-communities) are present within the Infrastructure Buffers, representing 23.75% cover. Over half of this total (40.47ha) is made up of M15 communities which are in mosaic with *Juncus* pasture, H10 dry heath, U4 grassland, M19 blanket mire, and U2 grassland communities and so this should be regarded as a worst-case scenario.

8.120 A total of 4.62ha (1.01ha of *Juncus* pasture/M15, M15/U4, M15-M19, and U2/M15 mosaics and 3.61ha of discrete M15) will be permanently lost to the proposed development. The loss of 1.59% M15 communities (0.35% *Juncus* pasture/M15, M15/U4, M15-M19, and U2/M15 mosaics, and 1.24% discrete M15) within the Infrastructure Buffers leaves 98.41% of this vegetation community still present in the Infrastructure Buffers following construction.

8.121 Ecological effects on M15 communities as a result of direct impacts associated with construction activities are considered to be **non-significant**. Confidence in this prediction is near certain.

8.122 A total of 3.58ha M15 communities (1.66ha of discrete M15 and 1.92ha in mosaic with *Juncus* pasture, U4 grassland, M19 blanket mire, and U2 grassland) are present within 5m of permanent infrastructure, representing 1.23% of the total within the Infrastructure Buffers. Therefore, there is potential for indirect impacts and temporary loss associated with the construction zones around infrastructure. With the mitigation measures detailed above including the requirement for ECoW and the requirement for pollution control during construction (to be taken forward within the proposed development CEMP) along with measures detailed within the PMP (**Technical Appendix 10.2**), effects on M15 vegetation communities as a result of indirect impacts will not result in loss of structure and function.

8.123 Ecological effects on M15 communities as a result of indirect impacts associated with construction activities are considered to be **non-significant**. Confidence in this prediction is near certain.

M17 *Trichophorum germanicum – Eriophorum vaginatum* blanket mire

8.124 A total of 98.82ha of M17 vegetation communities (including sub-communities) are present within the Infrastructure Buffers, representing 34.10% cover.

8.125 A total of 3.16ha of M17 vegetation communities will be permanently lost to the proposed development. The loss of 1.09% M17 communities within the Infrastructure Buffers leaves 98.91% of this vegetation community still present in the Infrastructure Buffers following construction.

8.126 Ecological effects on M17 communities as a result of direct impacts associated with construction activities are considered to be **non-significant**. Confidence in this prediction is near certain.

8.127 A total of 2.28ha M17 communities are present within 5m of permanent infrastructure, representing 0.79% of the total within the Infrastructure Buffers. Therefore, there is potential for indirect impacts and temporary loss associated with the construction zones around infrastructure. With the mitigation measures detailed above including the requirement for ECoW and the

requirement for pollution control during construction (to be taken forward within the proposed development CEMP) along with measures detailed within the PMP (**Technical Appendix 10.2**), effects on M17 vegetation communities as a result of indirect impacts will not result in loss of structure and function.

8.128 Ecological effects on M17 communities as a result of indirect impacts associated with construction activities are considered to be **non-significant**. Confidence in this prediction is near certain.

Fauna

Otter

8.129 Otter spraint and feeding signs in the form of predated fish were identified at points along the lower reaches of the Allt na h-Eaglaise watercourse, outwith the site boundary. No resting places were discovered within the study area and no evidence of otter presence within the site was encountered (although this cannot be ruled out). With pre-construction surveys providing up to date information on constraints and ECoW supervision ensuring that construction takes place in an appropriate manner, direct impacts as a result of destruction of otter resting places or disturbance of otter using resting places is considered unlikely. Work will primarily take place during daylight hours and as such, direct disturbance of foraging otters, should they venture on to site, is also considered to be unlikely. Direct impacts and associated effects are therefore considered to be **non-significant**. Confidence in this prediction is probable.

8.130 There is potential for indirect impacts on otters to result from pollution from construction activities. With the mitigation measures detailed above including the requirement for EnvCoW / ECoW and the requirement for pollution control during construction (to be taken forward within the proposed development CEMP), effects will be **non-significant**. Confidence in this prediction is probable.

Common Pipistrelle Bats

8.131 The abundance of prey and therefore conditions for foraging bats differ across habitats, with open habitats being less suitable for foraging bats than edge habitats and watercourse corridors. The Halladale River is located approximately 0.46km to the east of the site boundary at its closest point, and approximately 1.28km east of the nearest turbine location at its closest point. Proposed woodland felling is scheduled as part of the HMP and is focussed on a conifer plantation to the north west of the site, at a greater distance from the Halladale River than any of the proposed wind turbines or associated infrastructure.

8.132 While the habitat baseline will be changed by the proposed felling (as part of the HMP), dense conifer plantation is considered to be of low to negligible potential for roosting and / or foraging bats. When this is taken into account together with the low recorded use of the site by bats (and specifically common pipistrelle), and the fact that there are no extensive works to watercourses or waterbodies scheduled as part of the proposed development, and that construction works will primarily be taking place during daylight hours when bats are not active, it is predicted that there will be **no significant direct or indirect effects** on common pipistrelle bats. Confidence in this prediction is probable.

Designated Sites

8.133 Six designated sites have been taken forward for assessment:

- Caithness and Sutherland Peatlands SAC / Ramsar;
- West Halladale SSSI;
- East Halladale SSSI;
- Strathy Coast SSSI; and
- Red Point Coast SSSI.

Caithness and Sutherland Peatlands SAC / Ramsar

8.134 The Caithness and Sutherland Peatlands SAC / Ramsar has been taken forward due to the presence of otter within the study area. The short distance and hydrological connectivity between the site and the designation mean that otters present within the study area could be considered to be part of the designation's population.

8.135 As discussed in Sections 8.129 and 8.130, impacts and associated effects on otter are considered to be **non-significant**. Impacts and associated effects in relation to the Caithness and Sutherland Peatlands SAC / Ramsar are therefore also considered to be **non-significant**. Confidence in this prediction is probable.

8.136 The Caithness and Sutherland Peatlands SAC / Ramsar has also been designated for its rare and internationally important habitats including blanket bog. Given the separation distance between the SAC / Ramsar and actual elements of the proposed development, **no significant direct or indirect effects** are predicted on qualifying habitats of the SAC / Ramsar. Confidence in this prediction is near certain.

West Halladale SSSI

8.137 The West Halladale SSSI is designated for blanket bog and a number of avian features (impacts and effects on the avian features are addressed in **Chapter 9: Ornithology**). Given the separation distance between the SSSI and actual elements of the proposed development, **no significant direct or indirect effects** are predicted on qualifying habitats of the SSSI. Confidence in this prediction is near certain.

East Halladale SSSI

8.138 The East Halladale SSSI is located approximately 1.50km to the east of the proposed development at its closest point, and is designated for blanket bog and a number of avian features (impacts and effects on the avian features are addressed in **Chapter 9: Ornithology**). Given the separation distance between the proposed development and the SSSI, and the intervening topography including notable features such as the strath of the River Halladale and the A897, **no significant direct or indirect effects** (such as dewatering) are predicted on the qualifying habitats of the SSSI. Confidence in this prediction is near certain.

Strathy Coast SSSI

8.139 The Strathy Coast SSSI is located approximately 2.69km to the north east of the proposed development at its closest point, and is designated for geological and biological features (including machair, maritime cliff, sand dune, saltmarsh and vascular plant assemblage). Given the separation distance between the proposed development and the SSSI, and the intervening topography, and assuming that appropriate pollution control measures will be in place during construction, **no significant direct or indirect effects** (such as a pollution event affecting downstream SSSI habitats) are predicted on the qualifying habitats of the SSSI. Confidence in this prediction is near certain.

Red Point Coast SSSI

8.140 The Red Point Coast SSSI is located approximately 4.4km to the north east of the proposed development at its closest point, and is designated for geological and biological features (including maritime cliff and Scottish primrose). (Impacts and effects on the avian qualifying features are addressed in **Chapter 9: Ornithology**.) Given the separation distance between the proposed development and the SSSI, and the intervening topography, and assuming that appropriate pollution control measures will be in place during construction, **no significant direct or indirect effects** (such as a pollution event affecting downstream SSSI habitats) are predicted on the qualifying habitats of the SSSI. Confidence in this prediction is near certain.

Assessment of Operational Phase Impacts

Habitats

8.141 During the operational phase, only service vehicles will be present on the site and will be confined to site access tracks, with the potential for incidents and spillages affecting sensitive habitats being very low (see **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**). Therefore, **no significant adverse effects** on mire, wet dwarf shrub heath, blanket bog, grassland and woodland are predicted. Confidence in this prediction is near certain.

8.142 The HMP, provided in outline in **Technical Appendix 8.5**, includes aims to restore blanket bog habitats affected by historic drainage and planting of coniferous woodland, resulting in a **beneficial operational effect**. Confidence in this prediction is probable.

Fauna

Otter

8.143 During the operation of the proposed development, only occasional service vehicles will be present on the site and will be confined to site access tracks with an applied speed limit. As a result, **no significant effects** upon otters are predicted. Confidence in this prediction is near certain.

Common Pipistrelle Bats

8.144 Guidance issued by Natural England (Mitchell-Jones and Carlin, 2014) provides information regarding the likely risk to individual bat species and populations from wind turbine strike / barotrauma. Common pipistrelle are considered to have a medium risk of collision at an individual level. As described in paragraph 8.81, a low level of bat activity was recorded within the site and,

as such, the risk of impacts from collisions and barotrauma is considered to be low. Therefore, **no significant effects** upon bats are predicted. Confidence in this prediction is probable.

Designated Sites

Caithness and Sutherland Peatlands SAC / Ramsar

8.145 During the operation of the proposed development, only occasional service vehicles will be present on the site and will be confined to site access tracks with an applied speed limit. As a result, **no significant effects** upon otters, as a qualifying interest of the SAC are predicted. Confidence in this prediction is near certain.

8.146 The potential for incidents and spillages affecting sensitive qualifying habitats is very low (see **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**). Therefore, **no significant effects** in relation to the qualifying habitats of the SAC / Ramsar are predicted. Confidence in this prediction is near certain.

West Halladale SSSI

8.147 During the operation of the proposed development, only occasional service vehicles will be present on the site and will be confined to site access tracks. The potential for incidents and spillages affecting qualifying habitats is very low (see **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**). Therefore, **no significant effects** in relation to the qualifying habitats of the SSSI are predicted. Confidence in this prediction is near certain. (Operational phase impacts on qualifying avian species of the SSSI are assessed in **Chapter 9: Ornithology**.)

East Halladale SSSI

8.148 During the operation of the proposed development, only occasional service vehicles will be present on the site and will be confined to site access tracks. The potential for incidents and spillages affecting qualifying habitats is very low (see **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**), especially given the separation distance between the proposed development and the SSSI. Therefore, **no significant effects** in relation to the qualifying habitats of the SSSI are predicted. Confidence in this prediction is near certain. (Operational phase impacts on qualifying avian species of the SSSI are assessed in **Chapter 9: Ornithology**.)

Strathy Coast SSSI

8.149 During the operation of the proposed development, only occasional service vehicles will be present on the site and will be confined to site access tracks. The potential for incidents and spillages affecting qualifying habitats is very low (see **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**), especially given the separation distance between the proposed development and the SSSI. Therefore, **no significant effects** in relation to the qualifying habitats of the SSSI are predicted. Confidence in this prediction is near certain.

Red Point Coast SSSI

8.150 During the operation of the proposed development, only occasional service vehicles will be present on the site and will be confined to site access tracks. The potential for incidents and spillages

affecting qualifying habitats is very low (see **Chapter 10: Hydrology, Hydrogeology, Geology and Soils),** especially given the separation distance between the proposed development and the SSSI. Therefore, **no significant effects** in relation to the qualifying habitats of the SSSI are predicted. Confidence in this prediction is near certain. (Operational phase impacts on qualifying avian species of the SSSI are assessed in **Chapter 9: Ornithology**.)

Assessment of Decommission Phase Impacts

8.151 It is difficult to predict impacts which would arise from decommissioning and the confidence in all predictions is therefore considered to be uncertain due to the length of the operational period (30 years). It is assumed, however, that impacts are likely to be similar in nature to the construction phase but of lower magnitude, because infrastructure will be in place, allowing access to the site.

Habitats

8.152 Vegetation clearance will be limited and the land associated with the following components of the proposed development will be reinstated: turbine bases, some access tracks and substation.

8.153 Updated surveys will be required before the decommissioning phase begins, and appropriate mitigation measures will consequently be put in place to reduce likely effects to an acceptable level. In addition, appropriate screening and biosecurity measures will be established for materials used in habitat re-instatement if not sourced from the site itself. Therefore, **no significant effects**, either beneficial or adverse, are predicted for any important habitats as a result of decommissioning.

Fauna

8.154 During the decommissioning phase, there is the potential for impacts to protected or otherwise notable faunal species through disturbance and potentially direct mortality and destruction of resting places. The presence and distribution of protected faunal species at the time of decommissioning, potentially including species not currently present on site or not currently subject to legal protection, cannot be accurately predicted at this stage. As a result, update surveys and appropriate mitigation will be identified prior to decommissioning.

8.155 On the basis of impact predictions made in relation to disturbance during the construction stage, any effects on protected or otherwise notable faunal species are likely to be **not significant** during the decommissioning phase.

Designated Sites

8.156 As described in paragraphs 8.152 through 8.155, and with the qualifications stated therein, no significant effects on habitats and non-avian fauna are predicted. As such, **no significant effects** on the Caithness and Sutherland Peatlands SAC / Ramsar, and West Halladale, East Halladale, Strathy Coast and Red Point Coast SSSIs are predicted.

CUMULATIVE EFFECTS

8.157 The primary reason to undertake an assessment of cumulative impacts is to identify situations where impacts on important ecological features are judged to be unacceptable when combined with nearby existing or proposed development projects.

8.158 Six wind farm developments (either currently in the planning system awaiting determination, refused and currently the subject of an appeal, consented or operational) are located within 10km of the site (The Highland Council, 2021), and each of these was reviewed (**Table 8-10 refers**) [1]. Melvich Wind Energy Hub is also within 10km and shown in **Table 8-10**, however is currently at Scoping stage and therefore not considered further.

Table 8-10: Developments in the Wider Area (< 10km)

Wind Farm Name	Status	Distance to Kirkton Energy Park	Number of turbines
Limekiln S36 Variation	Consented	c. 7.46km east at its closest point	19 turbines
Limekiln Extension	Consented	c. 10.47km east at its closest point	5 turbines
Armadale Wind Farm	In Planning	c. 6.64km west at its closest point	12 turbines
Strathy North	Constructed	c. 4.47km south west at its closest point	33 turbines
Strathy Wood	Consented	c. 4.60km south west at its closest point	13 turbines
Strathy South	Consented	c. 7.95km south west at its closest point	35 turbines
Melvich Wind Energy Hub	Scoping	Immediately adjacent to the north	13 turbines

8.159 Cumulative impacts are only considered likely in relation to watercourses or fauna associated with watercourses. IEFs identified as part of this assessment which fit these criteria are otter, common

[1] The search criteria was for wind farm developments with three or more turbines, with tip heights greater than 50m. These parameters were selected because smaller developments are less likely to have quantitative data and / or may not even have an associated EIA Report.

pipistrelle bats, the Caithness and Sutherland Peatlands SAC / Ramsar, West Halladale SSSI, Strathy Coast SSSI and Red Point Coast SSSI.

8.160 **Limekiln S36 Variation** and **Limekiln Extension** are located approximately 7.46km and 10.47km east respectively of the proposed development at Kirkton and are located in commercial conifer plantation to the east of Beinn Ràtha. Otter activity was recorded along the Reay and Achvarasdal Burns; significant impacts are considered unlikely. Only low numbers of common pipistrelle were recorded during surveys and activity was focussed in the north of the site; significant impacts are considered unlikely.

8.161 **Armadale** is located approximately 6.64km west of the proposed development at Kirkton. Several otter spraints were recorded throughout the site with the majority identified in proximity to the Armadale Burn and unnamed watercourses in the south of the site. An otter couch was identified at the edge of a small lochan near to Beinn Chuidail and was marked by several spraints. Given the separation distance between the two proposals, significant impacts are considered unlikely. Only low numbers of common pipistrelle and very low numbers of soprano pipistrelle *Pipistrellus pygmaeus* were recorded during surveys; significant impacts are considered unlikely.

8.162 **Strathy North** is located approximately 4.47km south west of the proposed development at Kirkton. No survey information relating to otter was available for review. However, significant impacts are considered unlikely. No actual survey information relating to bats was available for review with documentation only noting that the River Strathy was an important foraging resource for bats within the local area with a number of roosting sites identified within buildings (unaffected by construction activities) close to the site boundary. Based on this, and experience of the local area and local bat populations, significant impacts are considered unlikely.

8.163 **Strathy Wood** is located approximately 4.60km south west of the proposed development at Kirkton. Evidence of otter (spraint and footprints) was recorded along the River Strathy (and tributaries), with some holt and couch potential; significant impacts are considered unlikely. Common pipistrelle was recorded at low level with very low numbers of soprano pipistrelle and *Myotis* sp.; significant impacts are considered unlikely.

8.164 **Strathy South** is located approximately 7.95km south west of the proposed development at Kirkton. Evidence of otter (spraint, anal jelly, and temporary layups and runs) were recorded on the banks of Loch nan Clach, Allt nan Clach, Allt Badain and the River Strathy; significant impacts are considered unlikely. Common pipistrelle was recorded at low level with a roost identified at Dyke (approximately 6km east of Strathy South, and 7.5km south of the proposed development at Kirkton); significant impacts are considered unlikely.

8.165 Given the separation distance and the intervening topography between the proposed development and **Armadale**, **Strathy North**, **Strathy Wood** and **Strathy South**, it is considered unlikely that these developments are having a significant influence on the baseline.

8.166 As discussed in paragraphs 8.129 – 8.132, 8.143 – 8.144, and 8.154 – 8.155, the proposed development will not introduce any significant effects on common pipistrelle or otter during construction, operation, or decommissioning. Therefore, no significant cumulative effects on otter or common pipistrelle bats from the proposed development and the other development projects are predicted.

8.167 In relation to designated sites, no significant cumulative impacts in relation to otter as a designated feature of the Caithness and Sutherland Peatlands SAC or qualifying habitats of the SAC / Ramsar and the SSSIs are predicted.

RESIDUAL EFFECTS

8.168 Taking into account the successful implementation of the mitigation measures contained within the CEMP, HMP and PMP, there will be no significant residual effects on IEFs in terms of the EIA Regulations.

SUMMARY

8.169 The ecological baseline conditions have been described and evaluated in order to identify IEFs associated with the proposed development. Proposed mitigation measures have been identified, including those embedded in design, and with reference to the proposed development CEMP, HMP and PMP where applicable.

8.170 Potential impacts upon IEFs as a result of the proposed development have been identified and the effect of these impacts on IEFs has been assessed in line with current guidance (CIEEM, 2018). No significant residual effects on IEFs were identified.

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