CHAPTER 8: ECOLOGY

Figures (Volume 3)

Technical Appendices (Volume 4)

8. Ecology

8.1 Executive Summary

8.1.1 This Chapter considers the potential impacts and their associated effects on ecological features, such as designated nature conservation sites, habitats and protected species in line with best practice guidance from the Chartered Institute of Environmental Management (CIEEM).

8.1.2 The study area was surveyed in 2020 to provide baseline information on habitats and faunal species. Surveys included an extended Phase 1 habitat survey and National Vegetation Classification (NVC) surveys, which included a Peatland Condition Assessment. The dominant habitats within the site boundary were wet heath and blanket bog. Five potential Groundwater Dependent Terrestrial Ecosystems (GWDTE) were recorded but it is considered that these are unlikely to be groundwater dependent in the setting of the study area. Protected species surveys identified the presence of otter, water vole and bats, and aquatic ecology surveys identified the presence of brown trout in very low densities.

8.1.3 The following important ecological features (IEF) were considered; the River Oykel Special Area of Conservation (SAC), Caithness & Sutherland Peatlands SAC, Grudie Peatlands Site of Special Scientific interest (SSSI), blanket bog, bats, otter, and water vole; effects were assessed during construction, operation and decommissioning phases of the Proposed Development with assumed embedded mitigation.

8.1.4 In the absence of further mitigation, significant effects in terms of the EIA Regulations are predicted for blanket bog.

8.1.5 Following the implementation of proposed mitigation and good practice measures such as the proposed outline Habitat Management Plan and Deer Management Plan, **no significant residual effects are predicted.**

8.2 Introduction

8.2.1 This Chapter of the EIA Report assesses the likely significant effects[1] of the Proposed Development with respect to terrestrial and freshwater ecology. The report should be read in conjunction with the development description provided in Chapter 3: Description of Development and with respect to relevant parts of other chapters, including Chapter 9: Ornithology and Chapter 10: Hydrology and Hydrogeology, where common receptors have been considered and where there is an overlap or relationship between the assessment of effects. In this Chapter, receptors are referred to as ecological features, to accord with the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) "Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine" Version 1.1 - updated September 2019. The term ecological feature is defined in the guidance as pertaining to habitats, species and ecosystems. Potential effects on European sites[2] are considered with regard to the Habitats Regulations (see paragraph 8.4.1) within the Habitats Regulations Appraisal (HRA) which is provided in Technical Appendix 8.8.

8.2.2 The Chapter has been prepared by Wood UK Plc (Wood). The lead author is an ecologist with over 15 years consultancy experience of EcIA and onshore wind farm developments, and a Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Desk and field survey work was also undertaken by Wood surveyors with over 20 and six years of professional ecological consultancy experience. All field surveys were led by surveyors with Associate or Member level of CIEEM. NVC and Peatland Condition surveys were undertaken by Alba Ecology the lead surveyor of which has extensive ecological field experience in Sutherland and across the north of Scotland.

8.2.3 This Chapter is supported by the Technical Appendices presented in Table 8.1, comprising supporting figures where relevant.

Table 8.1: Technical Appendices Supporting this Chapter

Technical Appendix
8.1 – Desk Study and Phase 1 Habitat Survey
8.2A – NVC, PCA and GWDTE Survey
8.2B – Turbine Vegetation Assessment Survey
8.3 – Protected Species Survey Report
8.4 – Bat Survey Report
8.5 – Aquatic Ecology & Fisheries Survey Report
8.6 – EcIA Scoping Rationale
8.7 – Habitat Loss Calculations
8.8 – Habitats Regulations Appraisal Screening

[1] In this Ecology Chapter, the term "potentially significant effects" is used in the sections prior to the "scope of the assessment" being determined, as it accords with CIEEM guidance. The term "likely significant effects" is used once the scope of the assessment has been determined. The use of this term is not to be confused with Likely Significant Effects (LSEs) as used in the context of a Habitats Regulations Appraisal (HRA).

[2] European sites include Special Protection Areas (SPA), Special Areas of Conservation (SAC), candidate SACs (cSAC) and Sites of Community Importance (SCI); these sites are collectively referred to as Natura 2000 sites. Potential SPAs (pSPA), possible SACs (pSACs), Ramsar sites and proposed Ramsar sites should also be considered in the same manner in accordance with national planning policy.

Technical Appendix
8.9 – Deer Management Plan
8.10 – Outline Habitat Management Plan

8.3 Scope of Assessment

8.3.1 The results of a desk study and field surveys have been used to determine the baseline context of the Site. The information available provides a robust basis for undertaking an Ecological Impact Assessment (EcIA) as:

- Desk study data are available for adjacent areas and this suggests that these are not markedly different to the Site in respect of the potential presence of notable ecological features[3];
- Aerial imagery and observation during field survey indicates that habitats within adjacent areas are similar to those within the Site. It is reasonable to assume therefore that ecological features in adjacent areas that may be affected by the Proposed Development are similar to those that occur within the Site; and
- The likelihood of potentially significant effects generally diminishes with distance from a Proposed Development, particularly where these relate to direct effects.

8.3.2 Field surveys predominantly followed the survey guidance that is widely recognised by consultees, including NatureScot. Full details are provided in the accompanying survey reports, which also note where deviations occurred due to issues including adverse weather, health and safety concerns and land access (Technical Appendices 8.1, 8.2A/B, 8.3, 8.4 and 8.5).

8.3.3 The Chapter assesses cumulative effects arising from the addition of the Proposed Development to other developments currently in the planning process (i.e. submitted applications, under construction and consented schemes). Wind farms that are operational are considered as part of the baseline, unless their full environmental effects are not yet known.

Study Area

8.3.4 The "Study Area" encompasses the area over which all desk-based and field data were gathered to inform the assessment presented in this Chapter. Due to the presence of multiple ecological features and many potential effects, the level and type of data collection varies across the Study Area (see Table 8.3). The Study Area comprises:

- The Site (i.e. the site boundary);
- The desk study area for European sites;
- The desk study area for legally protected and notable ecological features; and
- The field survey areas (including a buffer distance of 200m beyond the Site for protected species as shown in Technical Appendix 8.3 (Figure 8.3.2; and 250m on Figure 8.1.3)).

8.3.5 As the design of the Proposed Development has evolved iteratively, the Study Area, and its constituent parts, has been regularly reviewed to ensure that its extent was adequate

[3] Notable ecological features are those with conservation designations, but no legal protection.

to enable the assessment of all potentially significant effects on the ecological features identified. Changes to the initial developable area, or the precise nature of the Proposed Development, have been reviewed in light of the ecological features present (this being informed by the data gathering exercise) and the potential effects that could occur. At each stage of design evolution, the extent of the Study Area, including all of its components, was tested using the methodology described in Section 8.7 to ensure adequate information was available on which to base an assessment.

Consultation Responses

8.3.6 Table 8.2 summarises the scoping and consultation responses relevant to ecology and nature conservation and provides information on where and/or how they have been addressed in this assessment.

8.3.7 Full details on the consultation responses and scoping opinion can be reviewed in Chapter 5: Scoping and Consultation, and associated appendices.

Table 8.2: Consultation Responses

Consultee and Date	Issue Raised	Response/Action Taken
Scoping Consultation Responses [2019 Scoping Opinion] – October 2019		
Scottish Ministers	**Fisheries** Advice provided by Marine Scotland Science (MSS) and Kyle & Sutherland District Salmon Fishery Board (KSDSFB) in relation to guidelines on survey / monitoring programme should be taken on board.	Freshwater ecology, aquatic habitats, fish and designated sites are considered within this Chapter. An Aquatic Ecology and Fisheries Survey Report is presented in Technical Appendix 8.5. Engineering activities in the water environment considered in Chapter 10: Hydrology and Hydrogeology. Baseline water quality monitoring would be carried out pre-construction and subsequent monitoring during construction and operation, in line with the CEMP to be adopted by the Applicant's appointed Principal Contractor. An outline CEMP is included in the EIA Report (Technical Appendix 3.1).
	Peat Peat depth and vegetation surveys along with a peat management plan will be required to be part of the EIA Report along with a Peatslide Hazard and Risk Assessment.	National Vegetation Classification (NVC) surveys, including peatland condition assessment surveys are summarised within this chapter and presented in Technical Appendix 8.2A. Survey data were used to differentiate quality of blanket bog habitats across the Site. The results of Peat depth surveys are detailed in Chapter 11: Geology and Carbon Balance. This was used to help develop the site layout and, where possible, avoid important blanket bog areas. A Peat Landslide Hazard and Risk Assessment is included in the EIA Report (Technical Appendix 11.2) along with an outline Peat Management Plan (Technical Appendix 11.3).
	Management Plans The Company should take on board The Highland Council's (THC) comments regarding Habitat Management Plan, Deer Management Plans (if any are present within the Site) and Biodiversity Action Plan.	An outline Habitat Management Plan (HMP) is provided within Technical Appendix 8.10. The core aims of the outline HMP are to restore and enhance blanket bog. A Deer Management Plan (DMP) is presented in Technical Appendix 8.9.
Kyle & Sutherland District Salmon Fishery Board (KSDSFB)	**Fisheries** KSDSFB would expect any environmental assessment to include:	Freshwater ecology, aquatic habitats, fish and designated sites are considered within this Chapter. KSDSFB scope and methodology has been addressed. An Aquatic Ecology and Fisheries Survey Report is presented in Technical Appendix 8.5.

Consultee and Date	Issue Raised	Response/Action Taken
	• Fish habitat data in any potentially affected watercourse both within and out with the physical boundary of the Proposed Development; • Fish presence, distribution and abundance data in all potentially affected watercourses; • Macro-invertebrate data in all potentially affected watercourses; • Freshwater pearl mussel (FWPM) abundance and distribution data in all potentially affected watercourses; • Hydrology data, including artificial drainage watercourses; • Water quality data (i.e. turbidity, pH, dissolved organic carbon, acid-neutralising capacity, etc.) in all potentially affected watercourses; and • Peat slide risk assessment.	Baseline water quality monitoring would be carried out pre-construction and subsequent monitoring during construction and operation in line with the CEMP adopted by the Applicant's appointed Principal Contractor. An outline CEMP is included in the EIA Report (Technical Appendix 3.1). A Peat Landslide Hazard and Risk Assessment is included in the EIA Report (Technical Appendix 11.2).
	Fish Surveys and Pearl Mussel KSDSFB notes that the Applicant highlights data obtained from targeted fish surveys undertaken as part of a previous application in the scoping report. KSDSFB suggests that such information is likely to be outdated and new surveys should be undertaken. KSDSFB believes that investigations into the status of pearl mussel populations within the Cassley catchment have been carried out subsequent to the original application and suggest that SNH (now NatureScot) be contacted to obtain any relevant information available from such surveys.	Updated fish surveys were undertaken in 2020 and the results are provided in Technical Appendix 8.6. Freshwater pearl mussel data were obtained from NatureScot and have informed the assessment.
Marine Scotland Science	**River Oykel SAC** The Proposed Development is drained by watercourses within the River Cassley which forms part of the River Oykel Special Area of Conservation (SAC); salmon is a qualifying feature for this designation status. Both salmon and trout are listed as priority species for conservation in the Scottish Biodiversity List and should be considered.	A detailed fish habitat survey was carried out in 2020 and is presented in Technical Appendix 8.5. Fish surveys that identified the distribution and quality of fish habitat and fish species present were conducted in the streams draining the Study Area and these identified the main existing obstacles to fish migration. The River Oykel SAC, salmon and trout are considered in this Chapter and addressed in Technical Appendix 8.6. An HRA report is provided in Technical Appendix 8.8.

Consultee and Date	Issue Raised	Response/Action Taken
	Water Quality and Fish MSS advise that the Applicant carries out the following in the EIA: • Consult the MSS generic scoping guidelines; • Site characterisation surveys of the water quality and fish populations within the watercourses which could potentially be impacted as a result of the Proposed Development. Surveys should follow MSS guidelines on survey / monitoring programmes. The results from the surveys should be presented in the EIA Report along with a detailed description of proposed mitigation measures and monitoring programmes; and • Consider the potential cumulative impacts on water quality and fish populations associated with adjacent (operational and consented) wind farms and hydro schemes, particularly in the selection of control sites in the monitoring programmes.	Fish surveys (including water quality sampling) have been undertaken, with results presented in Technical Appendix 8.6. Surveys follow MSS guidance and potential cumulative impacts are considered. Mitigation proposals follow best practice hierarchy of firstly avoiding impacts on water bodies, and secondly reducing impacts where they cannot be avoided. Detailed mitigation measures to protect waterbodies during construction, operation and decommissioning are considered in Chapter 11: Hydrology and Hydrogeology and the outline CEMP (Technical Appendix 3.1). Baseline water quality monitoring would also be carried out pre-construction and subsequent monitoring during construction and operation in line with the CEMP adopted by the Applicant's appointed Principal Contractor. An outline CEMP is included in the EIA Report (Technical Appendix 3.1). A Peat Landslide Hazard and Risk Assessment is included in the EIA Report (Technical Appendix 11.2).
NatureScot	**Hydrology and Hydrogeology** The River Oykel SAC is a very sensitive receptor, and is hydrologically connected through multiple watercourses throughout the wind farm site. Therefore, it will be important to show how effective pollution (including silt) control measures will be to ensure that good water quality conditions can be maintained during construction in all weather conditions. Impacts to this protected area should be assessed against the site's Conservation Objectives.	Potential impacts on the River Oykel SAC are considered within this chapter and addressed in Technical Appendix 8.6. Mitigation measures are presented in the Section 8.8. Detailed mitigation measures to protect waterbodies during construction, operation and decommissioning are considered in Chapter 10: Hydrology and Hydrogeology and the outline CEMP (Technical Appendix 3.1), which also includes pollution control measures. A HRA report is presented in Technical Appendix 8.8 and potential impacts to this protected area are assessed against the site's Conservation Objectives.
	EIA Scope In context of the new development boundary, it may be possible to scope out Strath an Loin SSSI, which is 2 km to the north. This protected area is important for its bog habitat only and at this distance it is unlikely to be adversely affected (this does not include birds or otters which may still be linked to the Caithness and	Strath an Loin has been scoped out of further detailed assessment based on the distance from the Proposed Development. Scoping rationale is presented in Technical Appendix 8.6. Otters are considered as a qualifying feature of the Caithness & Sutherland Peatlands SAC, and supporting habitat is linked.

Consultee and Date	Issue Raised	Response/Action Taken
	Sutherland Peatlands SPA or SAC). Should this proposal change, this may need to be re-evaluated.	
	Terrestrial Ecology The proposal abuts Grudie Peatlands SSSI, which is protected for its nationally important bog habitat and breeding populations of upland birds, including: golden plover, dunlin and greenshank. Impacts on all these features should be assessed within the EIA Report.	The scoping of potential impacts on Grudie Peatlands SSSI is considered in Technical Appendix 8.6 and taken through for further assessment within this Chapter (Section 8.11). Potential impacts on upland birds are considered in Chapter 9: Ornithology.
	Policy & Legislation Within the 2012 application for this development, all habitats recorded were considered of local importance. SPP (2014) indicates that this may no longer be the case.	The Proposed Development has evolved through an iterative design process to inform the layout and minimise placement of infrastructure on sensitive habitat (in particular near natural blanket bog) and deeper areas of peat, where possible. Scoping assessment rationale is presented in Technical Appendix 8.6, which includes consideration of relevant planning policy.
	Peat and Carbon Rich Soils Carbon rich and peat soils, together with peatland habitats, extend over large areas of this site, including the area currently proposed for development. NS therefore advise that SSE needs to demonstrate through the EIA Report and draft Construction Method Statement that a wind farm can be built on this site without significant loss and damage to these nationally important interests.	The Proposed Development has evolved through an iterative design process to inform the layout and minimise placement of infrastructure on sensitive habitat (in particular near natural blanket bog) and deeper areas of peat, where possible. This has been informed through NVC surveys, peatland condition (both are presented in Technical Appendix 8.2A), as well as peat depth surveys, the results of which are provided in Chapter 11: Geology and Carbon Balance.
	EIA Scope, Peat and Carbon Rich Soils The EIA Report should consider both on-site and off-site impacts, particularly any potential effects on the adjacent Caithness and Sutherland Peatlands SAC and the downstream River Oykel SAC. This should include consideration of areas of hydrological and peat mass connectivity between the development area and protected areas. A revised Peat Landslide Hazard and Risk Assessment should also consider any potential risks and impacts to both SAC sites and how these can be mitigated.	The scoping of potential impacts on the Caithness and Sutherlands SAC and the River Oykel SAC is presented in Technical Appendix 8.6 and Section 8.10 and 8.11 in the chapter. Mitigation measures are presented in this chapter (Section 8.8). The results of peat depth surveys are reported in Chapter 10: Geology and Carbon Balance. This was used to help develop the site layout and where possible, avoid important blanket bog areas. A Peat Landslide Hazard and Risk Assessment is included in the EIA Report (Technical Appendix 11.2).
	EIA Scope, Ecology	An Outline HMP is provided in Technical Appendix 8.10.

Consultee and Date	Issue Raised	Response/Action Taken
	NS would welcome the inclusion of an outline Habitat Management Plan within the EIA Report, which could include measures to compensate for direct and / or indirect loss of peatland habitat and function.	The oHMP sets out proposed measures to compensate for the direct and indirect loss of blanket bog habitat.
	Otters NS acknowledge that a full protected species survey will be undertaken to facilitate a thorough and accurate assessment for the EIA Report. Impacts to otters and their resting places should be assessed in context to the Caithness and Sutherland Peatlands SAC in the first instance.	Protected species surveys have been undertaken, the results of which are presented in Technical Appendix 8.4. Otters are considered in Technical Appendix 8.6 and assessed as a feature of Caithness & Sutherland SAC within this chapter (Section 8.12).
	EIA Scope, Ecology NS recommend that a Deer Assessment is included within the EIA Report. This will help show whether there will be any effect (e.g. on bog protected areas) from the local deer population during construction works, etc.	An assessment of potential deer impacts on Grudie Peatlands SSSI is provided in Section 8.11, which is informed by a Deer Management Plan is provided in Technical Appendix 8.9.
RSPB	**Habitat and Protected Species Survey** RSPB would want to see updated habitat and protected species surveys as these were last undertaken in 2011.	The results of habitat and protected species surveys which were undertaken in 2020 are provided in Technical Appendices 8.1 – 8.5.
	EIA Scope RSPB note there is a significant amount of land identified within the Site, out with the development area, which may be used for habitat management. RSPB would welcome positive management of land for wildlife, provided the mitigation hierarchy has been followed in the design of any proposal. RSPB request that a detailed Habitat Management Plan (HMP) is prepared as part of the EIA and submitted with any application. In the 2012 application, RSPB commended proposed drain blocking to improve habitat in the long-term which could help reverse the unfavourable status of golden plover on the SPA.	RSPB's commendation of the proposed drain blocking from the previous application is acknowledged. An oHMP is provided in Technical Appendix 8.10. Proposals include peatland restoration measures and drain-blocking within candidate units outwith the Site, but within the Glencassley Estate boundary.
SEPA	**Pre-application Advice** SEPA would welcome the opportunity to provide early advice on the proposed layout and peat management and groundwater dependent	The proposed layout, habitat survey results and peat depth information was prepared for submission to SEPA in March 2021. However, it was not possible to engage with SEPA at this time due to the cyber-attack

Consultee and Date	Issue Raised	Response/Action Taken
	terrestrial ecosystem (GWDTE) sections of the EIA Report before they are formally submitted.	that SEPA were victim to in December 2020. SEPA made contact with the Applicant during April 2021, following the submission of the Gate Check Report, to confirm they were now operating in a limited capacity and to request the information to be resent. The Applicant resent the information on 04 May 2021. Further discussions were held with SEPA prior to submission, although due to the late stage of the project it was agreed that discussions between the Applicant and SEPA will continue post submission, once SEPA are in receipt of the EIA Report.
	Pre-application Advice If the 2012 habitat survey information is provided, SEPA would be happy to provide advice on whether it is considered still fit for purpose and the specific scope of any further assessment in relation to GWDTE.	Habitat survey information was updated in 2020 and is presented in Technical Appendices 8.2A and 8.2B.
The Highland Council	**Baseline Ecology Surveys** The EIA Report should provide a baseline survey of the bird and animals (mammals, reptiles, amphibians etc.) and the habitats present on the Site. Habitat enhancement and mitigation measures should be detailed, particularly in respect to blanket bog in the context of both biodiversity conservation and risk of peat slide. The EIA Report should address whether or not the Proposed Development could assist or impede delivery of elements of relevant Biodiversity Action Plans.	Baseline surveys are presented in Technical Appendices 8.1 – 8.5. Proposed mitigation measures are presented in this chapter (Section 8.9); compensatory habitat enhancement measures with respect to blanket bog are presented (Section 8.17); and also within the HMP (Technical Appendix 8.10).
	Baseline Ecology Surveys The EIA Report should provide a baseline survey of plants (and fungi) and trees present on the Site.	Ecological baseline surveys are presented in Technical Appendices 8.1 – 8.5.
	Designated ecological sites The EIA Report should address the likely impacts on the nature conservation interest of all designated sites in the vicinity of the Site and provide proposals for any mitigation to reduce any impacts to not significant.	The scoping of potential impacts on designated sites is presented in Technical Appendix 8.6. Proposed mitigation measures are presented in Section 8.8.

Consultee and Date	Issue Raised	Response/Action Taken
	Wild Deer If wild deer are present or use the Site, an assessment of the potential impact on deer will be required.	The scoping of potential impacts on designated sites are presented in Technical Appendix 8.6. A Deer Management Plan is also included as Technical Appendix 8.9.
	Aquatic Interests The EIA Report should address the aquatic interests within local watercourses or downstream, that may be impacted by the Proposed Development. The EIA Report should evidence consultation input from local fishery boards where relevant.	Freshwater ecology, aquatic habitats, fish and designated sites are considered within this chapter. An Aquatic Ecology and Fisheries Survey Report is presented in Technical Appendix 8.5, which follows consultation guidance provided by KSDSFB. The scoping of potential impacts on aquatic interest within local watercourses is presented in Technical Appendix 8.6. Engineering activities in the water environment considered in Chapter 10: Hydrology and Hydrogeology.
	GWDTE The EIA Report should include an assessment on Ground Water Dependent Terrestrial Ecosystems.	GWDTEs were mapped and summarised in Technical Appendix 8.2A. Impacts on GWDTEs are assessed in Chapter 10: Hydrology and Hydrogeology.
Additional Consultation Responses		
NatureScot 8 June 2020	**Advice on scope of bat surveys** The Bat Appraisal Report identified; Leisler's, Noctule and Nathusuis' pipistrelle to be at 'high risk' from wind turbine development. However, the 2019 guidance also identifies both soprano and common pipistrelle to be at high risk. Both of these species are known to occur in Sutherland. Although NatureScot recognise that the development area is an open moorland site, it does in fact support several linear features, such as; the wooded ravine (adjacent to the boundary) supporting the Allt Bad an t-Sagair Burn (NC4410). In addition, there is the Allt an Rasail Burn (NC4608) which lies at the edge of the Site. Glencassley Castle lies about 2km to the west of the development, which is likely to be attractive to bats. Therefore, taking into account the above factors, NatureScot recommend that the potential risk level should be re-assessed.	The following information is provided in Technical Appendix 8.5: Soprano pipistrelle and common pipistrelle have both been assessed as 'high risk' species as per the Bats and Onshore Wind Turbine Guidance (SNH et al. 2019). Potential risk level was re-assessed following initial evaluation and taking account of the factors raised by NatureScot. Full spectrum detectors have been used as per the 2019 guidance. A gap of around a month between Spring and Summer periods was achieved.

Consultee and Date	Issue Raised	Response/Action Taken
	NatureScot provide clarification that full-spectrum detectors should be used, as outlined within Best Practice Guidelines (Jan, 2019 – as above). The above mentioned water-courses would be suitable to sample, in addition to turbine locations, as per the Appraisal Report. As a result of the current COVID-19 restrictions, NatureScot are content that the Spring survey period runs slightly late (i.e. into June), but recommend around a one month gap before the onset of the Summer period is surveyed.	
Nature Scot 2 July 2020	**Engagement on scope of bat surveys and detector locations** Advice provided by NatureScot to ensure coverage of linear features.	Two further detector locations were included to ensure surveys captured linear watercourse features.
Scoping Consultation Responses [2020 Scoping Refresh] – February 2021		
NatureScot	**Protected Areas** The Proposed Development abuts a component part of the Caithness & Sutherland Peatlands Special Protection Area (SPA), Ramsar Site and Special Area of Conservation (SAC) protected for its upland birds, peatland habitats and otter. In addition, this proposal is hydrologically connected to the River Oykel SAC protected for its Atlantic salmon and freshwater pearl mussel.	All aforementioned protected areas are considered in this chapter. The scoping of potential impacts on the protected areas is presented in Technical Appendix 8.6 and Important Ecological Features (IEFs) are taken through for further assessment in this chapter (Section 8.10–8.15).
	Protected Areas The layout of the Proposed Development shows turbines in very close proximity to the Caithness & Sutherland Peatlands SAC (Grudie Peatlands SSSI) and close to watercourses which eventually flow into the River Oykel SAC. A Peat Slide Risk Assessment should be undertaken to inform the potential impacts upon all of these Protected Areas, and mitigation identified to reduce risk (e.g. turbine relocation or removal). Other assessments will also be required, as outlined in our previous scoping response.	The scoping of potential impacts on designated sites is presented in Technical Appendix 8.6 and IEFs are taken through for further assessment in this chapter (Sections 8.10 and 8.11). Potential impacts on these designated sites and their qualifying features, including through hydrological connectivity, are also addressed in this chapter (Section 8.8) and Chapter 10: Hydrology and Hydrogeology. A Peat Landslide Hazard and Risk Assessment is included in the EIA Report (Technical Appendix 11.2). Other assessments outlined in the 2019 Scoping Opinion include an outline HMP (Technical Appendix 8.10) and a Deer Management Plan (Technical Appendix 8.9).

Consultee and Date	Issue Raised	Response/Action Taken
SEPA	**Consultation** Prior to the formal submission of the application SEPA strongly encourage the Applicant to engage in further consultation. As a minimum, the following three layout plans showing all permanent and temporary works should be provided: • 50 m buffers to watercourses; • NVC survey results; and • all peat probing results (showing the location of individual peat probes, colour coded for depth). SEPA would also provide advice on any Groundwater Dependent Terrestrial Ecosystem (GWDTE) assessment or other work on peat such as the Peat Management Plan (PMP).	Scheme design and survey methodology has been fully informed by SEPAs published advice/guidance. 50m buffer plans are provided in Figures 10.1a-10.1c: Surface Water Features. NVC survey results are provided in Technical Appendix 8.2A (Figures 8.2.2A and 8.2.2B). Peat probing results are provided in Figures 11.3a-11.3f: Peat Depth Plan.
	Survey Work SEPA note that Phase 1 habitats and NVC surveys and Stage 1 peat probing have been undertaken and that Phase 2 peat probing is underway to refine the layout. It is stated that these will be submitted to SEPA during further pre-application discussions. We encourage these to be submitted as soon as possible to help inform the best environmental option for the site layout.	The proposed layout, habitat survey results and peat depth information was prepared for submission to SEPA in March 2021. However, it was not possible to engage with SEPA at this time due to the cyber-attack that SEPA were victim to in December 2020. SEPA made contact with the Applicant during April 2021, following the submission of the Gate Check Report, to confirm they were now operating in a limited capacity and to request the information to be resent. The Applicant resent the information on 04 May 2021. Further discussions were held with SEPA prior to submission, although due to the late stage of the project it was agreed that discussions between the Applicant and SEPA will continue post submission, once SEPA are in receipt of the EIA Report
SEPA **20 May 2021**	**NVC Survey** In regards to the NVC survey, it is difficult to review as many of the colours are very similar looking without having them labelled on the map. For example, there are four colours of green on the map which are almost identical and difficult to differentiate.	NVC mapping has been amended as requested, both in terms of the colour scheme for vegetation communities and the labelling of vegetation community polygons on the NVC plans. NVC figures are presented in Technical Appendix 8.2A.
The Highland Council **05 February 2021**	**Designated Ecological Sites** The EIA Report should address the likely impacts on the nature conservation interest of all designated sites in the vicinity of the Site	The scoping of potential impacts on designated sites is presented in Technical Appendix 8.6 and IEFs are taken through for further

Consultee and Date	Issue Raised	Response/Action Taken
	and provide proposals for any mitigation to reduce any impacts to not significant.	assessment in this chapter (Sections 8.10 and 8.11). Proposed mitigation is also presented in Section 8.8.
	Wild Deer If wild deer are present or use the Site, an assessment of the potential impact on deer will be required.	A Deer Management Plan included as Technical Appendix 8.9.
	Aquatic Interests The EIA Report should address the aquatic interests within local watercourses or downstream, that may be impacted by the Proposed Development. The EIA Report should evidence consultation input from local fishery boards where relevant.	The scoping of potential impacts on aquatic interest within local watercourses is presented in Technical Appendix 8.6. An Aquatic Ecology & Fisheries Survey Report is presented in Technical Appendix 8.5, which follows consultation guidance provided by KSDSFB. Proposed mitigation is presented in Section 8.8 of this chapter.
	GWDTE The EIA Report should include an assessment on Ground Water Dependent Terrestrial Ecosystems.	Impacts on GWDTEs are assessed in this chapter and Chapter 10: Hydrology and Hydrogeology.
Pre-Application Advice		
NatureScot 12 April 2021	**NVC Mapping** The NVC mapping provided is very helpful, but it is unfortunately constrained by similar colours representing very different habitats, for example M15c, U5b:M6c, H10a:U5:M6c M17b, M15d M18, U4a, M19 NatureScot recommend that a version which combines shading with labelling is considered essential for inclusion within the final Environmental Impact Assessment Report (EIAR).	NVC mapping has been amended as requested, both in terms of the colour scheme for vegetation communities and the labelling of vegetation community polygons on the NVC plans. NVC figures are presented in Technical Appendix 8.2A.
	Peatland Condition Assessment Plan The Peatland Condition Assessment Plan is potentially very useful, but a clear methodology (for example, was it mapped remotely or on	A clear methodology for the Peatland Condition Assessment is provided in Technical Appendix 8.2A, confirming that the assessment was based on the ground mapping, with peatland condition category definitions

Consultee and Date	Issue Raised	Response/Action Taken
	the ground) should be presented with condition category definitions, including information on habitat hybrids/mosaics.	provided, including information on habitat hybrids/mosaics/transitional communities.
	Habitat Infrastructure/Peatland Importance Table. It would be helpful to gauge the assessment of potential impacts, if the attached Peatland Importance Table could be completed and included within the EIAR. NatureScot anticipate that this table should make the assessment of 'wider-countryside' peatland habitat much easier to gauge.	An evaluation of ecological features has been provided in Technical Appendix 8.6, following EcIA Guidelines (CIEEM, 2018; 2019), which describes and justifies the level of importance assigned to the ecological features identified during the data gathering exercise carried out to inform the assessment. In light of the considered divergence between CIEEM EcIA guidance and evaluation of peatland interest or importance, we have presented material, which is hoped will provide appropriate information to determine the value of the peatland/blanket bog resource within the Study Area: • A Summary habitat infrastructure and habitats table has been presented in Annex 1 of Technical Appendix 8.2B. • An evaluation of the blanket bog resource has been presented in Technical Appendix 8.6 and Table 8.6.1b presents an evaluation of the blanket bog resource with reference to JNCC SSSI site selection criteria.
	Caithness & Sutherland Peatlands Special Area of Conservation (SAC) Potential impacts to peatland habitats within/connected to the Caithness & Sutherland Peatlands Special Area of Conservation (SAC) should be assessed against the Conservation Objectives for this Protected Area, see; https://www.nature.scot/professional-advice/protected-areas-and-species/protected-areas/international-designations/european-sites/protection-european-sites.	Potential impacts to peatland habitats within/connected to the Caithness & Sutherland Peatlands Special Area of Conservation (SAC) have been assessed against the Conservation Objectives of the SAC. This is presented in the Habitat Regulations Appraisal (HRA) screening report (Technical Appendix 8.8) and summarised in terms of EIA Regulations in this chapter (Section 8.8).
	Deer NatureScot are led to believe that deer densities on this estate have been very high in the recent past. It will therefore be important for SSE to consider the potential impact of deer on any post-construction peatland habitat management. This will be in addition	Deer are considered in terms of displacement during construction within this Chapter (Section 8.8) and also in relation to the post construction peatland habitat management within the outline HMP (Technical Appendix 8.10) and Deer Management Plan (Technical Appendix 8.9)

Consultee and Date	Issue Raised	Response/Action Taken
	to an assessment for any potential deer displacement effects on neighbouring peatland Protected Areas during construction.	
	Habitat Management Plan NatureScot did not note any suggestion that there may be an Outline Habitat Management Plan (HMP) to assist with this development. NatureScot strongly recommend that a HMP is considered to support this wind farm proposal, on the basis that there is likely to be construction impacts on peatland, combined with the importance Scottish Government places on restoring degraded peatland carbon stores, see; https://www.gov.scot/news/peatland-restoration-fund-tackles-global-climate-crisis/.	An outline HMP is presented in Technical Appendix 8.10.
Gate Check Response 2021		
NatureScot	**Ecological Survey – Existing wind farm access track** NatureScot recommend that the existing access track to Achany Wind Farm, where a new borrow-pit and construction compound are proposed, should receive an appropriate level of ecological / ornithological survey work, to inform potential impacts of construction access. In this regard, it would be more effective to clear and establish these work locations ahead of the bird breeding season (e.g. 15 March - for hen harrier) to help reduce the risk that the development programme is impinged by Protected Species.	An extended Phase 1 habitat survey of the access track was undertaken of the existing access track a proposed new borrow pit and construction compound. Ongoing water vole monitoring surveys have been undertaken annually since 2008 and most recently in 2021. Baseline data from these surveys are presented in Technical Appendix 8.3, which have informed the assessment.

8.4 Legislation, Policy and Guidance

Legislative Context

8.4.1 The following legislation has been considered in the assessment of the effects on ecological features:

- Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) as transposed into Scots Law[4] (as provided in Scottish Government guidance) by;
  - the Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland) (the "Habitats Regulations"); and
  - The Conservation of Habitats and Species Regulations 2017 which apply in Scotland in relation to certain specific activities (reserved matters), including consents granted under Section 36 of the Electricity Act 1989;
- Wildlife and Countryside Act 1981 (as amended in Scotland);
- The Wildlife and Natural Environment (Scotland) Act 2011 (as amended) (WANE Act);
- Nature Conservation (Scotland) Act 2004 (as amended);
- The Protection of Badgers Act 1992 (as amended);
- Water Environment and Water Services (Scotland) Act 2003 (WEWS Act); and
- Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003.

Planning Policy Context

- UK BAP (https://jncc.gov.uk/our-work/uk-bap/);
- Scottish Planning Policy (https://www.gov.scot/publications/scottish-planning-policy/);
- The Scottish Biodiversity List (https://www.nature.scot/scottish-biodiversity-list);
- The 2020 Challenge (https://www.gov.scot/publications/2020-challenge-scotlands-biodiversity-strategy-conservation-enhancement-biodiversity-scotland/); and
- The Highland BAP (https://www.highlandenvironmentforum.info/biodiversity/action-plan/).

Technical Guidance

8.4.2 Publications that provide guidance that is relevant to the assessment of potentially significant effects on ecology are listed below:

- Chartered Institute of Ecology and Environmental Management (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.1 - updated September 2019. Chartered Institute of Ecology and Environmental Management, Winchester;
- Scottish Government (2013). The Scottish Biodiversity List (SBL);
- SNH (2010) Floating Roads on Peat;

[4] https://www.gov.scot/publications/eu-exit-habitats-regulations-scotland-2/
Following the EU exit, policy on the protections and standards afforded by the Habitats Regulations remains unchanged, but there have been some changes in terminology and the Scottish Ministers now exercise some functions that were previously carried out at an EU level.

- SNH (2013) Constructed tracks in the Scottish Uplands. Updated September 2015;
- SNH (2016a) Planning for development: What to consider and include in Habitat Management Plans;
- SNH (2016b) Planning for development: What to consider and include in deer assessments and management at development sites;
- SNH (2018). Environmental Impact Assessment Handbook;
- SNH (2019). Good Practice during Wind Farm Construction;
- SNH (2019). Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation;
- SEPA (2008) Engineering in the water environment good practice guide: construction of river crossings;
- SEPA (2017). LUPS-GU4 Land Use Planning System SEPA Guidance Note 4;
- SEPA (2017). LUPS-GU31 Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems, Version 3;
- Forestry Commission (2003) Forests and Water Guidelines fourth edition;
- Anderson, R. (2010) Restoring afforested peat bogs: results of current research. Forestry Commission Research Note; and
- CIRIA C648 (2006), Control of water pollution from linear construction projects;
- Scottish Renewables, SNH, SEPA, Forestry Commission Scotland, Historic Environment Scotland and Marine Scotland Science (2019). Good Practice during Wind Farm Construction (4th Edition).

8.4.3 Technical guidance used to define the survey methods and inform this assessment are referenced in Technical Appendices 8.1, 8.2A/B, 8.3, 8.4 and 8.5.

8.5 Methodology

Desk Study

8.5.1 The extent of the desk study area(s) and field survey area (see Table 8.3) were determined based on best practice guidance and a high-level overview of the types of ecological features present, and the potential effects that could occur. The Study Area was defined on a precautionary basis to ensure that, as a minimum, the Zone of Influence[5] (ZoI) relevant to all ecological features (see Table 8.7 and Section 8.7) were covered during baseline data collection activities.

8.5.2 A desk-based data-gathering exercise was undertaken to obtain existing information relating to relevant ecological features, these being: statutory and non-statutory biodiversity sites; habitats and species of principal importance[6]; legally protected and controlled species; and other conservation notable species that have been recorded over the previous 10 years (i.e. since 2011). Desk Study Methodology and data compiled within the desk Study Area (which is the Site and the additional areas of search beyond) is presented in Technical Appendix 8.1.

[5] The Zone of Influence (ZoI) in this context is the area over which an individual ecological feature may be subject to a potentially significant effect resulting from changes in the baseline environment due to the Proposed Development.
[6] Scottish Biodiversity List features.

8.5.3 Where appropriate, data were drawn from existing ecological records and site information obtained through field surveys conducted in 2011 as part of the 2012 Glencassley Wind Farm Application.

Table 8.3: Information Relevant to the Desk Study

Ecological Feature	Example/Description	Study Area
Statutory sites designated under International conventions or European legislation	Special Areas of Conservation (SACs) and Wetlands of International Importance (also known as Ramsar sites)	The Site and within 10km of it.
Statutory sites designated under national legislation	Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs)	The Site and within 10km of it.
Locally designated sites	Often termed as Local Wildlife Sites (LWS), County Wildlife Sites (CWS), Sites of Interest for Nature Conservation (SINC)	The Site and within 10km of it.
Scottish Biodiversity List; Red listed species; and Legally protected species.	Flora, fauna and habitats of principal importance for the conservation of biodiversity in Scotland. Species recorded on The IUCN Red List of Threatened Species and/or local Red Lists for the UK or relevant sub-units (e.g. regions or counties) and legally protected habitats and non-avian species including those listed on Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended in Scotland) and those included on Schedules 2 and 5 of the Habitats Regulations. Badgers are protected under the Protection of Badgers Act 1992.	The Site and within 2km of it.
Legally controlled species	Legally controlled species include those listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended in Scotland).	The Site and within 2km of it.

8.5.4 Table 8.4 lists the organisations and other sources that have supplied data, together with the nature of the information provided.

Table 8.4: Sources of Desk Study Data

Source	Nature of Information Provided
Glencassley Wind Farm Environmental Statement 2012, Chapter 8.	Baseline studies relating to: Phase 1 habitat survey and NVC Report; Bat Survey Report; and Protected Terrestrial Mammal Report.
Applied Ecology (2020). Achany Wind Farm Habitat Management Plan: 10 - year review	Location of water vole habitat, management prescriptions, groundworks undertaken, and monitoring results.
NatureScot's interactive map facility at (https://sitelink.nature.scot/home)	Access to data and information on key protected areas across Scotland.
Scottish Environment Protection Agency (SEPA) website (www.sepa.org.uk)	Information on the classification of the ecological status of waterbodies under the Water Framework Directive (WFD) and Freshwater Fish Directive (FFD).
National Biodiversity Network (NBN) Atlas information service (https://nbnatlas.org/)	Commercially-available records of protected and/or notable species from within the last ten years.
Highland Biological Records Group (HBRG)	Data request for records of protected and/or notable species within a 2km radius of the Site (extended to 10km for bats).
NatureScot	Data request for freshwater pearl mussel records and vascular plant species records within 3km[7] of the Site.
Google Maps and Google Earth websites	Review of aerial imagery to determine potential habitats and features of interest.

8.5.5 Field survey methodologies are described fully in Technical Appendices 8.1 – 8.5.

Field Surveys

8.5.6 A Phase 1 habitat survey was undertaken between 25 May 2020 and 19 June 2020, in order to update baseline results obtained to inform the 2012 Glencassley Wind Farm Environmental Statement (ES). An additional visit to map Phase 1 habitats along the length of the proposed access route was carried out on 05 November 2020 (Technical Appendix 8.1 and accompanying Figure 8.1.3). The survey was conducted in accordance with standard guidance (JNCC, 2010) to establish the presence and distribution of semi-natural vegetation within the Study Area.

8.5.7 An NVC survey, including an assessment of potential Ground Water Dependant Terrestrial Ecosystems (GWDTEs) and a peat condition assessment, was carried out by Alba Ecology in September 2020. This survey was also carried out to update baseline results obtained to inform the 2012 Glencassley Wind Farm ES. Full details relating to survey methods and results are provided in Technical Appendix 8.2A and accompanying Figures 8.2.1 – 8.2.5. In addition to this, a vegetation assessment was also undertaken at the proposed turbine locations; this assessment is provided in Technical Appendix 8.2B.

[7] A radius of 3km from central Ordnance Survey (OS) grid reference NC 45907 07752 was selected for the data request to NatureScot relating to vascular plant species.

Otter and Water Vole Survey

8.5.8 An otter (*Lutra lutra*) and water vole (*Arvicola amphibius*) survey following standard methods was carried out on all watercourses and waterbodies within the Study Area between 04 and 06 August 2020 (See Technical Appendix 8.3).

8.5.9 The survey comprised a walkover assessment of the main water features, associated banks, and up to 50 m from bank tops, plus any other areas of suitable habitat within the Study Area (Technical Appendix 8.3, Figures 8.3.1 – 8.3.3). Two surveyors worked in parallel in order to cover the area efficiently and to comply with health and safety requirements associated with work in/near water.

Bat Surveys

8.5.10 Bat survey work was carried out within the site during 2020 in accordance with best practice guidelines (Collins, 2016 and SNH *et al.*, 2019). Field surveys comprised a habitat assessment for bats and an activity monitoring survey using automated bat detectors.

8.5.11 Automated bat detectors were deployed within the site to record full spectrum bat echolocation calls throughout the entire night, for a minimum of ten consecutive nights over three monitoring periods during the active bat season (April to October), capturing early-, mid- and late-season activity and following NatureScot's recommendation of allowing a one month gap following the Spring period before the onset of the Summer period was surveyed. The detectors were set up to record bat echolocation calls continuously from 30 minutes before sunset to 30 minutes after sunrise.

8.5.12 Automated detectors were initially placed at or near 14 proposed turbine locations to provide a representative sample of bat activity at or close to these points. Following further consultation with NatureScot, two additional full spectrum detectors were placed at agreed locations to capture data from linear features (watercourses). These were added to the survey suite in August 2020. For full details relating to the location of each detector and associated deployment dates, please refer to Table 8.4.2 in Technical Appendix 8.4.

Aquatic Ecology and Freshwater fish Surveys

8.5.13 Aquatic ecology and fisheries surveys were undertaken on 16 and 17 September 2020 (See Technical Appendix 8.5). Surveys comprised fisheries habitat (including freshwater pearl mussel - *Margaritifera margaritifera*), benthic invertebrate fauna sampling and fish fauna (electrofishing survey) and water quality sampling at sites within and adjacent to the Proposed Development. The catchments, receiving waterbodies and their national grid references (NGRs) were also considered.

Assumptions and Limitations

8.5.14 Automated detectors were initially deployed at proposed turbine locations and within areas of suitable bat habitat. However, following alterations to the proposed infrastructure layout during 2020, the position of several automated detectors no longer represented refined turbine locations. Despite this, a robust dataset relating to bat activity across the Site was collected by ensuring that the static detectors were suitably distributed across the Site from the outset in accordance with recommended placement criteria (SNH, 2019).

8.5.15 Limitations associated with the use of the Ecobat analysis tool, as required by SNH *et al.,* (2019), have also been identified. For example, the outputs of the Ecobat tool are

considered in the context of wider data collection from third parties and are not accepted as a rigorous appraisal method in isolation. In addition, due to technical issues associated with the Ecobat software - relating to the summing of contacts in the species group *Pipistrellus* - records from the genus *Pipistrellus* were removed from Ecobat output data[8] to ensure that the data are summed accurately and that the *Pipistrellus* species group is not underrepresented. In order to overcome this issue, the study includes an assessment and comparison of contact data collected, allowing the calculation for average number of contacts per night, which provides an effective method to compare relative activity levels across the Site.

8.5.16 No further limitations to the assessment completed for the Proposed Development were identified. Surveys, where required, have been completed as agreed with the relevant statutory agency, NatureScot, to ensure that baseline information is valid against which the assessment of effects can be completed. As required by the relevant professional guidance (CIEEM, 2018), the precautionary principle has been adopted when undertaking the assessment to ensure that conclusions on residual effects are robust and realistic. Any assumptions made regarding effects to IEFs are based on current guidance, scientific knowledge, and the expert professional opinion of the author and are therefore deemed appropriate in the context of the site.

Scoping Methodology

Determining Importance of Ecological Features

8.5.17 The method for determining the scope of the assessment corresponds with topic specific guidance (i.e. CIEEM, 2018). The relevant receptors, IEFs, the spatial and the temporal scope are all defined in this section. The methodology followed has multiple stages, enabling the scope of the assessment to be progressively refined.

8.5.18 For this ecological assessment the first stage in determining the scope of the assessment is to identify which ecological features identified through the desk study and field surveys (Technical Appendices 8.1, 8.2A/B, 8.3, 8.4 and 8.5) are 'important'[9] in the context of the Proposed Development. Following CIEEM (2019) guidance, the importance of ecological features is first determined with reference to UK legislation and policy and then with regard to the extent of habitat or size of population that may be affected by the Proposed Development.

8.5.19 As the importance of ecological features is determined with regard to the extent of habitat or size of population that may be affected by the Proposed Development, the level of importance can differ from that which would be conferred by legislative protection or identification as a conservation notable species and from one development to another. For example, water vole is important at a national level because it is a SBL species and has experienced a population decline of more than 25% in the last 25 years. However, a small population that could be affected by a development would be assessed

[8] A total of 32 *Pipistrellus* contacts (relating to common/ soprano pipistrelle and common/ Nathusius' pipistrelle) were omitted from the Ecobat analysis output.

[9] Importance relates to the quality and extent of designated sites and habitats, habitat/species rarity and its rate of decline. Ecological features that are not considered to be important are those that are sufficiently widespread, unthreatened and resilient and with populations that will remain viable and sustainable irrespective of the Proposed Development.

as being of less than national importance if there is alternative well-connected and suitable habitat nearby that has the capacity to support individuals that may be displaced.

8.5.20 Wherever possible, information regarding the extent and population size, population trends and distribution of the ecological features has been used to inform the categorisation described in Table 8.5 to determine importance for the purposes of this assessment. Where detailed criteria or contextual data are not available, professional judgement was used to determine the level of importance.

8.5.21 An explanation of all determinations of importance are then provided in Table 8.10 (for scoped in ecological features) and Tables 8.6.1a/b and 8.6.2 (Technical Appendix 8.6) (for all ecological features initially included in the assessment) to ensure transparency.

Table 8.5: Importance of the Proposed Development for Ecological Features

Geographic Context of Importance	Example / Description
International or European	1. European sites including SACs, candidate SACs and Sites of Community Importance (SCI), Special Protection Areas (SPAs), potential SPAs (pSPA) and possible SACs (pSACs) should also be considered in the same manner in accordance with National Planning Policy. 2. Areas of habitat or populations of species which meet the published selection criteria based on discussions with NatureScot and field data collected to inform the EcIA for designation as a European site or Ramsar site, but which are not themselves currently designated at this level.
National	1. A nationally designated site including SSSIs and National Nature Reserves (NNRs). 2. Areas (and the populations of species which inhabit them) which meet the published selection criteria guidelines for selection of biological SSSIs but which are not themselves designated based on field data collected, and in agreement with NatureScot. 3. Scottish Biodiversity List (SBL) habitats and species, and legally protected species that are not addressed directly in Part 2 of the "Guidelines for Selection of Biological SSSIs" but can be determined to be of national importance using the principles described in Part 1 of the guidance. 4. Large areas of priority habitats listed on Annex 1 of the Habitats Directive and smaller areas that are essential to maintain the viability of that ecological resource. 5. Areas of Ancient Woodland e.g. woodland listed within the Ancient Woodland Inventory.
Regional	1. Regionally occurring populations of SBL species will be considered to be of regional importance in the context of published information on population size and distribution. 2. Large areas of modified or degraded priority habitats, which are important in a regional context.
County	1. Local Nature Reserves and Non-statutory designated sites. 2. Areas which based on field data collected to inform the EcIA meet the published selection criteria for those sites listed above (for habitats or species, including those listed in relevant Local Biodiversity Action Plans) but which are not themselves designated.

Geographic Context of Importance	Example / Description
Local	1. SBL habitats and species and legally protected species that based on their extent, population size, quality etc are determined to be at a lesser level of importance than the geographic contexts above. 2. Common and widespread semi-natural habitats occurring in proportions greater than may be expected in the local context. 3. Common and widespread native species occurring in numbers greater than may be expected in the local context.
Negligible	1. Common and widespread semi-natural habitats and species that do not occur in levels elevated above those of the surrounding area. 2. Areas of heavily modified or managed land uses (e.g. hard standing used for car parking, as roads etc.)

8.5.22 Where protected species are present and there is the potential for a breach of the legislation, those species should always be considered as 'important' features. With the exception of such species receiving specific legal protection, or those subject to legal control (e.g. invasive species), all ecological features that were determined to be of negligible importance have been scoped out of the assessment at this stage. Furthermore, ecological features of local importance were also scoped out at this stage where there was a specific technical justification to do so. This is because effects on them would not influence the decision-making about whether or not consent should be granted for the Proposed Development (in other words a significant effect in EIA terms could not occur). This approach is consistent with that described in CIEEM 2018. Specific justification for exclusion of each of these ecological features is provided in Tables 8.6.1a/b and 8.6.2 (Technical Appendix 8.6).

8.5.23 All legally protected species and ecological features that are of sufficient importance were then taken through to the next stage of the scoping assessment.

Spatial Scope

8.5.24 The construction and operational phases of the Proposed Development may result in the following direct and indirect environmental changes that could significantly affect ecological features:

- Direct habitat loss: permanent and temporary habitat loss during construction and operational phases due to land-take as a result of the Proposed Development; and land management may change as a result of the Development (including mitigation/enhancement measures);
- Indirect habitat loss: disturbance/displacement to protected or notable species from habitat they would otherwise use for nesting, foraging, commuting, sheltering or roosting because of works activities during construction or by associated maintenance activities during operation;
- Habitat modification as a result of changes to the surface hydrology during construction and operation;
- Noise, vibration and movement of machinery and operations during the construction phase; and noise and movement of turbines during operation;

- Pollution associated with accidental spillage of fuels, oils, run-off and dust emission i.e. via direct contact, air or water; and
- Criminal offences: Potential disturbance or harm to nationally or European protected species (EPS), which could potentially lead to commission of criminal offence(s).

8.5.25 The key to establishing which environmental changes may result in likely significant effects, is the determination of a ZoI for each IEF identified. ZoIs differ depending on the type of environmental change (i.e. the change from the existing baseline) as a result of the Proposed Development and the ecological feature being considered.

8.5.26 The most straightforward ZoI to define is the area affected by land-take and direct land-cover changes associated with the Proposed Development. This ZoI is the same for all affected ecological features.

8.5.27 By contrast, for each environmental change that can extend beyond the area affected by land-take and land-cover change (e.g. increased noise associated with construction activities within the land-take area), the ZoI may vary between ecological features, dependent upon their sensitivity to the change and the precise nature of the change. For example, a water vole might only be disturbed by noise generated close to its burrow, while other species (e.g. many invertebrates) may be unaffected by changes in noise. In view of these complexities, the definition of the ZoI that extends beyond the land-take area was based upon professional judgement informed (as far as possible) by a review of published evidence (e.g. disturbance criteria for various species) and discussions with the technical specialists who are working on other related assessments.

8.5.28 It should be noted that the avoidance of potentially significant effects through the design process is implicitly taken into account through the consideration of each ZoI, as are standard construction practices that are common-place. When scoping in or out ecological features from further assessment, embedded mitigation measures (see Table 8.11) associated with general good practice that are described within the Code of Practice for planning and development (BSI, 2013) and Good Practice during Wind Farm Construction (Scottish Renewables *et al.*, 2019) would be taken into account (e.g. dust suppression, appropriately scheduled vegetation removal etc.).

Temporal Scope

8.5.29 The temporal scope of the ecological assessment is consistent with the period over which the Proposed Development would be carried out and therefore covers a.) construction; b.) operation; and c.) decommissioning periods (as outlined in Chapter 3: Description of Development).

- Construction of the Proposed Development is anticipated to be completed over a period of approximately 18 months;
- Operation of the Proposed Development is anticipated to be operational for 50 years;
- Decommissioning would be anticipated to take approximately 12 months; and
- The environmental changes identified in Section 8.8 could occur during the construction phase and operational phase of the Proposed Development. The effects of the environmental changes are considered with respect to their duration, frequency, timing and reversibility for each of the scoped in ecological features in Table 8.9.

Assessment Methodology

Introduction

8.5.30 The approach that has been used in this ecological assessment aligns to the standard industry guidance provided by CIEEM (2018).

8.5.31 The assessment has been based upon not only the results of the desk study and field surveys, but also relevant published information (for example on the status, distribution, sensitivity to environmental changes and ecology of the features scoped into the assessment, where this information is available), and professional knowledge of ecological processes and functions.

8.5.32 For each scoped-in IEF (see Table 8.10), potential effects were assessed against the current baseline conditions for that feature during construction, operation and decommissioning.

8.5.33 Throughout the assessment process, the initial results of the assessment regarding potentially significant effects have been used to inform whether additional baseline data collection is required, together with the identification of industry standard mitigation measures that should be embedded into the Proposed Development to avoid or reduce adverse effects or to deliver enhancements. The results of the assessment as set out in Section 8.8, therefore reflect the final scheme design (i.e. incorporating the mitigation by design and embedded mitigation measures described in Section 8.7 and Table 8.11).

8.5.34 The spatial extent of the assessment reflects the area occupied by the ecological feature that is being assessed and, as a minimum, the ZoI of the changes that may affect it.

8.5.35 Where part of a designated site is located within the ecological ZoI relating to a particular biophysical change as a result of the Proposed Development, an assessment has been made of the effects on the designated site as a whole. A similar approach has been taken for areas of notable habitat.

8.5.36 For species that occur within the ZoI, the assessment has considered the total area that is used by the affected individuals or the local population of the species (e.g. for foraging or commuting) rather than the footprint of the Site.

Significance Evaluation Methodology

Overview

8.5.37 CIEEM (2018) defines a significant effect as one "that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general".

8.5.38 When considering potentially significant effects on ecological features, whether these be adverse or beneficial, the following characteristics of environmental change are taken into account:

- Extent - the spatial or geographical area over which the environmental change may occur;
- Magnitude - the size, amount, intensity or volume of the environmental change;
- Duration - the length of time over which the environmental change may occur;
- Frequency - the number of times the environmental change may occur;

- Timing - the periods of the day/year etc. during which an environmental change may occur; and
- Reversibility - whether the environmental change can be reversed through restoration actions.

Magnitude of Change

8.5.39 A scale for the magnitude of the environmental change as a result of the Proposed Development has been described in Table 8.6 to provide an understanding of the relative change from the baseline position, be that an adverse or beneficial change.

Table 8.6: Guidelines for the Assessment of the Scale of Magnitude

Scale of Change	Criteria and Resultant Effect
High	The change permanently (or over the long-term) affects the conservation status of a habitat/species, reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area e.g. Natural Heritage Zone (NHZ) and relative to the wider habitat resource/species population, a large area of habitat or large proportion of the wider species population is affected. For designated sites, integrity is compromised. There may be a change in the level of importance of the receptor in the context of the project ZoI.
Medium	The change permanently (or over the long-term) affects the conservation status of a habitat/species reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area and relative to the wider habitat resource/species population, a small-medium area of habitat or small-medium proportion of the wider species population is affected. There may be a change in the level of importance of this receptor in the context of the project ZoI.
Low	The quality or extent of designated sites or habitats or the sizes of species' populations, experience some small-scale reduction or increase. These changes are likely to be within the range of natural variability and they are not expected to result in any permanent change in the conservation status of the species/habitat or integrity of the designated site. The change is unlikely to modify the evaluation of the receptor in terms of its importance in the context of the project ZoI.
Very Low	Although there may be some effects on individuals or parts of a habitat area or designated site, the quality or extent of sites and habitats, or the size of species populations, means that they would experience little or no change. Any changes are also likely to be within the range of natural variability and there would be no short-term or long-term change to conservation status of habitats/species receptors or the integrity of designated sites.
Neutral	A change, the level of which is so low, that it is not discernible on designated sites or habitats or the size of species' populations.

Determining Significance - Adverse and Beneficial Effects

8.5.40 Adverse effects are assessed as being significant if the favourable conservation status of an ecological feature would be lost as a result of the Proposed Development. Beneficial effects are assessed as those where a resulting change from baseline improves the quality of the environment (e.g. increases species diversity, increases the extent of a particular habitat etc., or halts or slows down an existing decline). For a beneficial effect to be considered significant, the conservation status would need to positively increase in line with a magnitude of change of "high" as described in Table 8.6.

8.5.41 Conservation status is defined as follows (as per CIEEM, 2018):

- *"For habitats, conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and typical species within a given geographical area";* and
- *"For species, conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area".*

8.5.42 SNH (2018a) detail that a species' conservation status is favourable when:

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

8.5.43 SNH (2018a) recommends that the concept of maintaining a favourable conservation status of a species should be applied at the level of its Scottish population, to determine whether an impact is sufficiently significant to be of concern. This is a test which makes good ecological sense and maintains compatibility with the aims of National legislation and Government policy.

8.5.44 Nonetheless, developments should be assessed, alone or in combination, at a regional (or analogous scale) for their impacts on a species population size, trend and range. An adverse impact on a species at a regional scale (within Scotland) may adversely affect its national conservation status (for example where a specific region holds the majority of the national population).

8.5.45 The decision as to whether the conservation status of an ecological feature would alter has been made using professional judgement, drawing upon the information produced through the desk study, field survey and assessment of how each feature is likely to be affected by the Proposed Development.

8.5.46 A similar procedure is used where designated sites may be affected by the Proposed Development, except that the focus is on the effects on the integrity of each site; defined as:

> *"The coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified".*

8.5.47 The assessment of effects on integrity draws upon the assessment of effects on the conservation status of the features for which the Site has been designated. Where these features are not clearly defined, which is often the case for non-statutory biodiversity sites, it is necessary to use professional judgement to identify the interest features or obtain additional information about the interest features from NatureScot, Scottish Wildlife Trust or the local planning authority responsible for identifying these sites, so that sufficient information on which to base an assessment is available.

Habitat Regulations Appraisal

8.5.48 The Proposed Development has potential connectivity with the European sites as identified under The Habitats Regulations. As a result, in addition to the ecological impact assessment detailed in this chapter (based on EIA Regulations), there is a requirement for

the completion of a Habitats Regulations Appraisal (HRA), which is presented in Technical Appendix 8.8.

8.5.49 This Technical Appendix provides the information required for the Competent Authority to establish whether or not the construction, operation and decommissioning of the Proposed Development would be likely to have Adverse Effects on Site Integrity (AESI) of these European sites in view of best scientific knowledge and with regards to the conservation objectives of the European sites, specifically the species for which the sites were designated and the habitats upon which they depend.

8.6 Baseline

8.6.1 The following description of the ecological features provides a summary of the ecology baseline as determined through desk study and field survey. Detailed descriptions of the desk study and field survey results provided in Technical Appendices 8.1 – 8.5**.**

Current Baseline

8.6.2 The Proposed Development is situated approximately 1.5km north-east of the River Cassley and approximately 5km south-west of the western shore of Loch Shin, near Lairg. It is an upland area of rocky hills and valleys dominated by mire and heath habitat, and forms part of a sporting estate. There are several distinct summits, two small lochs, and a number of watercourses that intersect the Site. The estate is primarily used for fishing, with some deer-stalking also taking place.

8.6.3 Two wind farms are located to the south-east of the Proposed Development, including Rosehall (19 turbines) and Achany (19 turbines).

8.6.4 The estate includes small pockets of existing mixed and coniferous plantation woodland along its western extent and has three Scottish Rural Development Programme applications for native woodland planting approved by the Forestry Commission (now Scottish Forestry). These lie outwith the Site and will not alter the baseline conditions of the site.

Desk Study

Statutory Nature Conservation Sites (International/European)

8.6.5 No statutory designated nature conservation sites for ecological features occur within the Site boundary of the Proposed Development. Designated nature conservation sites related to ornithology are considered in Chapter 9: Ornithology. SSSIs notified for geological features are discussed in Chapter 11: Geology and Carbon Balance.

8.6.6 Designated sites of ecological importance located within 10km of the Proposed Development are shown on Figure 8.1. Table 8.7 details the relevant designated nature conservation sites that have potential connectivity with the Proposed Development. All other designated nature conservation sites are detailed in Technical Appendix 8.1.

Table 8.7: Designated Sites

Site Name	Qualifying Interest Features	Distance from Proposed Development at Closest Point
River Oykel SAC	Atlantic salmon (*Salmo salar*), freshwater pearl mussel	3.5km south of Site access point; watercourses flow across the Site drain into the River Oykel
Caithness & Sutherland Peatlands SAC	Acid, peat-stained ponds, blanket bog, clearwater lochs with aquatic vegetation, depressions on peat substrate, marsh saxifrage *Saxifraga hirculus*), otter	The SAC site borders the eastern boundary of the Site
Caithness & Sutherland Peatlands Ramsar	Blanket bog, aggregation of breeding birds	The Ramsar site borders the eastern boundary of the Site
Strath an Loin SSSI	Blanket bog	2.5km north-west of the Site
Grudie Peatlands SSSI	Blanket bog, breeding wader interest	Borders the eastern boundary of the Site
Kyle of Sutherland Marshes SSSI	Flood plain fen; wet woodland; and Nationally important assemblage of plant species	4km south-west of Site access point
Ben More Assynt SSSI	Caledonian igneous caves, eutrophic lochs, oligotrophic rivers and streams, upland assemblages	10km north-west of the Site boundary

Desk Study and Historical Field Surveys

Vegetation Surveys

8.6.7 Field survey work conducted to inform the previous Glencassley Wind Farm ES identified that the Study Area was comprised predominantly of wet dwarf shrub heath (formed mainly of NVC community M15) and unmodified blanket bog habitat (made up of M17, M18, and M19 NVC communities). The remainder of the Study Area contained a variety of dry dwarf shrub heath (NVC communities H10a and H17), marshy grassland (M25a), small patches of unimproved acid grassland (U4 and U5) and M6c acid flush habitat, and a network of small watercourses and lochans.

Protected Species

Otter

8.6.8 The data search carried out by HBRG for legally protected and priority species within 2km of the Site returned no records of otter within the last 10 years.

8.6.9 Field survey work carried out in 2011 to inform the previous Glencassley Wind Farm ES identified no evidence of otter within the Site. Otter field signs were however identified within the wider study area (outside the Site boundary), including sightings at Loch Langwell approximately 3km to the west of the Site.

Water vole

8.6.10 The data search returned no records of water vole within 2km of the Site recorded within the last 10 years.

8.6.11 Field surveys carried out during 2011 identified patches of active water vole habitat within the Site, including burrows, runways, and latrines within marshy grassland habitat

adjacent to the Allt an Rāsail watercourse. Further water vole field signs were identified along a small tributary of the Allt Langwell, and within marshy grassland adjacent to Allt an Dubh Loch Bhig (both areas now positioned outside the Site boundary).

8.6.12 A review of the most recent HMP report for Achany Wind Farm also identified the presence of six discrete water vole colonies along watercourses positioned within the operational wind farm site boundary.

Bats

8.6.13 The desk study data search identified records of common pipistrelle, soprano pipistrelle and Daubenton's bat in flight within 10km of the site boundary. Records relating to roosting common pipistrelle, brown long eared bat, *Pipistrellus* species, and Daubenton's bat within 10km of the site boundary were also identified during the data search.

8.6.14 Activity transect surveys carried out in 2011 identified a single common pipistrelle pass within the Site.

Freshwater pearl mussel

8.6.15 Freshwater pearl mussel habitat suitability assessment and survey of watercourses that were carried out by Cosgrove (2011). No evidence of freshwater pearl mussel was recorded within any watercourses surveyed.

8.6.16 Freshwater pearl mussel records were also provided by NatureScot. Hastie *et al* (2015) indicated that the River Cassley currently supports a low-density freshwater pearl mussel population with juvenile mussels, indicating recent successful recruitment. The freshwater pearl mussel population within the River Cassley is considered to be quite small and scattered, perhaps numbering 1000-2000 mussels at most, overall.

Field Surveys

8.6.17 Full details of the results of the field surveys undertaken for the Proposed Development are provided in Technical Appendices 8.1 – 8.5.

Phase 1 habitats

8.6.18 The dominant habitats present in the study area are wet heath and blanket bog, as shown on Figure 8.3 (including target notes, which are also described in Technical Appendix 8.1). Photographs taken during surveys are provided in Technical Appendix 8.1 (Annex C). All potentially sensitive habitats recorded in the study area are detailed in Table 8.8.

Table 8.8: Habitat types

Habitat type	Area (ha)
Wet dwarf shrub heath	683.1
Blanket bog	520.31
Wet heath/ blanket bog mosaic	370.56
Marsh/ marshy grassland	170.4
Coniferous plantation woodland	60.73
Dry dwarf shrub heath - acid	31.35
Mixed plantation woodland	27.14
Acid grassland/ marshy grassland mosaic	25.62

Habitat type	Area (ha)
Not surveyed	10.45
Hardstanding	9.65
Dry heath/ wet heath mosaic	9.56
Dry dwarf shrub heath/ acid grassland mosaic	7.99
Wet heath/ marshy grassland mosaic	7.38
Dry modified bog	4.3
Dry modified bog/ blanket bog mosaic	3.53
Standing water	3.51
Other habitat	3.1
Dry modified bog/ marshy grassland mosaic	2.38
Marshy grassland/ blanket bog mosaic	1.71
Semi-improved acid grassland	1.51
Wet modified bog	1.12
Recently felled woodland	0.62
Continuous bracken	0.45
Buildings	0.07

8.6.19 Running water habitat is also present in the study area, including the Allt an Rasail, Allt Bad an t-Sagairt, Allt na Criche and Glen Rossal Burn. A number of watercourse crossings occur as part of the Proposed Development and further details are provided in Technical Appendix 10.2: Watercourse Crossings Assessment.

8.6.20 No invasive non-native plant species were recorded during surveys.

GWDTE

8.6.21 The NVC survey identified the presence of five plant communities that are potential GWDTEs within the Study Area. Table 8.9 provides further information on the potential GWDTE recorded in the study area. Further details including target notes are provided in Technical Appendix 8.2A (Annex 1).

8.6.22 A summary of NVC communities within the Study Area that may indicate the presence of GWDTE is provided within the NVC Report (Technical Appendix 8.2A). A full description of this assessment and the GWDTEs is provided in Chapter 10: Hydrology and Hydrogeology and Technical Appendix 10.1: GWDTE Risk Assessment.

Table 8.9: Vegetation Communities Recorded On-Site

NVC Community	Potential Groundwater Dependency (SEPA, 2017)
M23b *Juncus effusus/acutiflorus-Galium palustre* mire, *Juncus effusus* sub-community	**High**
M25a *Molinia caerulea - Potentilla erecta* mire *Erica tetralix* sub-community M25b *Molina caerulea – Potentilla erecta* mire community, *Anthoxanthum odoratum* sub-community	**Moderate**

NVC Community	Potential Groundwater Dependency (SEPA, 2017)
M15 *Trichophorum cespitosum-Erica tetralix* wet heath M15b *Trichophorum cespitosum-Erica tetralix* wet heath, typical sub-community M15c *Trichophorum cespitosum-Erica tetralix* wet heath, *Cladonia spp*. sub-community M15d *Trichophorum cespitosum-Erica tetralix* wet heath, *Vaccinium myrtillus* sub-community	**Moderate**
M6a *Carex echinata-Sphagnum fallax* mire, *Carex echinata* sub-community M6c *Carex echinata-Sphagnum fallax* mire, *Juncus effusus* sub-community M10a *Carex dioica – Pinguicula vulgaris* mire, *Carex viridula ssp. Oedocarpa – Juncus bulbosus* sub-community	**High**

NVC and Peatland Condition Assessment

8.6.23 The results of the 2012 and 2020 surveys are highly comparable, with a similar arrangement of communities. Both survey reports identified M15c as the most common community, with large areas of blanket bog including M17a, M17b and M19.

8.6.24 Most of the blanket bog recorded within the Study Area was considered to be modified through grazing and possibly other historic management practices such as burning, including much of the M17b, M19 and M20 communities. This also included some areas of M17a and M17c, although these were generally in better condition than the M17b as they usually had more bog-mosses present. The least modified blanket bog community, which was considered closest to 'Near-Natural', was the M18 community, which contained a complex of bog pools and some bog-moss hummocks. Although some grazing impacts were evident, the bog-moss carpet was fairly intact. Some of the M17a was also placed within this Near-Natural category due to the hummock and hollow structure and the surface water present. The rest of the M17a was Modified to some extent with some areas also Drained, although it was generally less modified than areas of M17b. Some areas of M17a were placed in Modified, but it was noted that they were close to the Near-Natural category (Technical Appendix 8.2A - Figure 8.2.3).

8.6.25 There were multiple drainage ditches present in the south section of the Study Area. Some of the drainage ditches appeared to be effectively draining the bog, although some appeared to be less effective. Some of the blanket bog (particularly degraded areas of M17b and M3) was also considered likely to be Actively Eroding and Drained through erosion features.

8.6.26 The blanket bog in the Study Area was considered mostly to be of intermediate condition, with areas of 'bad quality' where the erosion was most pronounced (M3 and eroding areas of blanket bog, particularly M17b) and small areas of 'good quality' where there were multiple surface water pools, hummocks and a degree of natural surface pattern. The condition of the peatland habitats was considered to be similar between 2012 and 2020 with impacts from deer grazing evident, but generally unchanged. The areas of actively eroding peatland was also not noticeably changed between to the two field survey visits (2012 and 2020).

8.6.27 Given the northern location of the Study Area, and the reasonable quality of at least some of the blanket bog, there is a degree of uncertainty to the activity level. However, given

the lack of surface water-logging features, bog-mosses and hummock and hollows, it was considered that the blanket bog was likely to be largely inactive and in intermediate condition. However, this does not preclude that limited peat formation may occur at some locations under some circumstances.

Turbine Location Vegetation Assessment

8.6.28 All of the proposed turbine locations were visited in September 2020 (as well as an additional visit in October 2020 to particular locations) and the vegetation present was reported on. The vegetation was typically either wet heath NVC community M15c or blanket bog with NVC communities M17a, M17b and M19 all represented.

8.6.29 Micro-erosion features were very common within the bog habitat in the form of bare peat patches within the vegetation. Surface water and bog-moss cover was more common in some areas and some of the blanket bog, e.g. the M17a blanket bog, particularly at T16 and T20 (prior to further micrositing), was considered to be in intermediate to good condition and may be active or partially active.

Protected and Notable Species

8.6.30 Full details on the methods and findings of the protected species field surveys are detailed within the relevant technical baseline reports (Technical Appendices 8.3, 8.4 and 8.5).

Otter

8.6.31 A review of the otter survey report prepared for the previous Glencassley Wind Farm ES in 2012 found no evidence of otter within the Site during surveys in 2011. Otter field signs were however identified within the wider study area (outside the Site boundary), including sightings at Loch Langwell approximately 3km to the west of the Site.

8.6.32 Otter surveys undertaken in August 2020 identified widespread otter presence along watercourses within the Study Area, in the form of spraints, prints, and resting places. A total of three resting places (two couches and one holt) were identified, with an additional three potential resting places (one potential couch and two potential holts) also recorded within the Study Area. The highest level of otter activity was recorded along the Allt an Rasail, as highlighted by numerous spraints and presence of resting sites identified along the surveyed stretch of this watercourse.

8.6.33 The results of the 2020 field survey indicate that otters utilise watercourses within the Study Area for foraging, commuting and resting purposes and it is likely that otters move between the Loch Shin and River Cassley catchments. The overall level of otter field signs recorded within the Study Area during the 2020 surveys is considerably higher than those recorded in 2011, which may be the result of seasonal and temporal variations in the pattern of otter activity, climatic conditions, and/or changes in food source. The evidence from both surveys suggests however that the study area is primarily used by otters for travelling between these two catchments, although seasonal foraging is also considered likely. Further details relating to the findings of the otter field survey are provided in Technical Appendix 8.3.

Water vole

8.6.34 A review of the most recent 2021 survey records for Achany Wind Farm HMP identified the presence of seven discrete water vole colonies within the operational wind farm site

boundary (Applied Ecology, 2021). Water vole colonies were located along the following watercourses:

- The Allt a' Bhadain and Allt Sron nan larnachan - positioned within 20m of the existing wind farm access track at its closest point. The access track also crosses the Allt a' Bhadain near the Site entrance;
- Three un-named tributaries of the Strath Ghruididh - positioned approximately 70m from an operational turbine and 470m from the main wind farm access track; and
- Adjacent to the headwaters of a further un-named tributary of the Strath Ghruididh, within the north-west of the wind farm site, approximately 100m from the existing wind farm access track.

8.6.35 Within the Site itself, suitable upland water vole habitat (comprising well-vegetated banks of rush vegetation and/ or purple moor grass mire) was found to exist along sections of all watercourses and associated tributaries within the Study Area. Evidence of active water vole habitat was identified in pockets of marshy grassland situated adjacent to watercourses within the Study Area (Figure 8.3.3, Technical Appendix 8.3). Field evidence in the form of burrows, runways, and latrines were recorded. The most extensive areas of active water vole habitat were distributed along the upper reaches of the Allt an Rāsail watercourse, which defines part of the eastern boundary of the Site. Smaller pockets of active habitat were also present adjacent to the Allt an Rāsail watercourse within the south of the Study Area, and along the upper reaches of the Allt Bad na t-Sagairt watercourse. For full details relating to the distribution of water vole habitat within the Study Area, please refer to Technical Appendix 8.3.

Bats

8.6.36 The results of bat survey work carried out within the Site during 2020 are summarised below. For full details relating to bat activity results, please refer to Technical Appendix 8.4**.**

8.6.37 Due to the open exposed nature of the landscape, no potential roosting features were identified within the Site and associated 200m buffer. Potential roosting habitat for bats may however exist approximately 1.5km south-west of the Site (within Glen Cassley valley), where stands of ancient woodland and built structures (such as the historic Glencassley Castle, homes, and outbuildings) are present.

8.6.38 Automated detectors deployed within the Site recorded a total of 715 contacts from four species/ species groups [common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle *Pipistrellus pygmaeus*), *Myotis* species, and brown long-eared bats (*Plecotus auritus*)] over 588 monitoring nights.

8.6.39 The most frequently encountered species was common pipistrelle, accounting for 70.77% of contacts, with activity recorded across all monitoring locations. The second most encountered species/ species group was *Myotis*, accounting for 21.12% of contacts. The remaining limited number of contacts were attributed to *Pipistrellus* species (4.48%), Soprano pipistrelle (2.10%) and brown long-eared bat (1.54%).

8.6.40 Through comparing data to similar sites within a 200km radius using the online Ecobat tool[10], bat activity levels across the Site were assessed as follows:

- Common pipistrelle – an overall 'moderate' level of activity, with periods of 'high' activity recorded during Summer and Autumn months at automated detectors positioned near watercourses;
- Soprano pipistrelle – an overall 'low' level of activity across the Site with one occasion of 'moderate' activity also recorded during the survey period;
- *Myotis* species –an overall 'low' level of activity across the Site with occasions of 'moderate to high' activity also recorded during the survey period; and
- Brown long eared bat - an overall 'low' level of activity across the Site, with occasions of 'moderate' activity also recorded during the survey period.

Aquatic Ecology and Fish

8.6.41 The results of aquatic ecology and fisheries survey work carried out within the Site during 2020 are summarised below. For full details relating to survey results, please refer to Technical Appendix 8.5**.**

8.6.42 Single trout (parr) were recorded at two locations. Both of these watercourses are unnamed and distributed within the Allt an Rasail catchment. The Allt an Rasail catchment is limited by the impassable barrier (natural) in the lower reaches.

8.6.43 No fish were recorded at other survey locations which indicates small to zero population status, a lack of habitat for fish fauna, restricted/no access within the watercourse for spawning and nursery, no survival within previous years and issues with access from the main river downstream (barrier).

8.6.44 None of the sites identified or sampled were considered to be suitable for freshwater pearl mussel. Two sites (A12 and A14) were rated as Moderate based on their optimal habitat characteristics, but overall the suitability is limited by the impassable (natural) barrier downstream, the shallow water depths, the heavy grade substrates, lack of bankside cover and absence of fish fauna.

Future Baseline and Modifying Influence

8.6.45 According to SNH 2018, baseline studies should identify the existing processes of change in the environment, which are likely to influence the character of the Site or its surrounds, so that any changes that are predicted to occur due to the Proposed Development can be distinguished from those which are expected to occur anyway. The predicted future environmental conditions which would exist if the Proposed Development did not materialise is known for EIA purposes as the 'do nothing scenario'.

8.6.46 Determining a future baseline draws upon information about the likely future use and management of the Site in the absence of development, known population trends (for species), climate change and any other proposed developments (consented or otherwise) that may act cumulatively with the Proposed Development components to affect ecological features.

[10] http://www.ecobat.org.uk/

8.6.47 The majority of the study area is presently managed as a private asset, with limited deer stalking, so the 'do nothing scenario' would likely be for the area to remain primarily unchanged if the Proposed Development did not go ahead.

Developments

8.6.48 There are no forthcoming developments with planning permission or consent within the Site boundary and on this basis, there is no likely change to baseline conditions for the purposes of assessment.

Nearby Wind Farm Development Projects

8.6.49 The Site is situated adjacent (along its south-eastern access track) to two operational wind farm schemes, Rosehall (19 turbines/operational in 2013) and Achany (19 turbines/ operational in 2010). As such, baseline conditions established for ecological features may be affected in time, to some extent by actions undertaken on or around these other developments outwith the Proposed Development, including operational maintenance and decommissioning activities. Such changes and the timescales over which they may occur and be realised cannot be quantified to any degree of accuracy given the range of other factors which could also influence a species or habitat status and distribution within such a range. Such changes are therefore not considered for the purpose of this assessment.

8.6.50 Three further wind farm schemes are recorded within 10km of the Site, including Braemore (18 turbines), Sallachy (9 turbines) and Meall Buidhe (9 turbines). These are considered further in Section 8.11 (Cumulative Effects).

Deer Management

8.6.51 The arrangements for deer management in Scotland reflect the fact that deer can roam freely across boundaries between estates, farms, forests and landholdings. For red deer (*Cervus elaphus*), the main open hill species in the study area, a collaborative approach to their management has developed in conjunction with the East Sub-Group, West Sutherland Deer Management Group. Consequently, deer in the study area cannot be seen in isolation from those on adjacent sites and estates. Deer counts have recently (March 2019) been carried out on Glencassley Estate and the surrounding estates, on behalf of these estates.

8.6.52 The deer species and number present within Glencassley Estate are based on the data provided within the East Sub-Group Deer Management Plan, which covers the period 2016 until 2021. This plan is primarily concerned with the open range red deer population. The current red deer density over the open range area of the sub-group as a whole was recorded as 9.5 deer/100Ha in 2019, a decrease from 11.8/100Ha from the 2016 count. The current open hill density across Glencassley Estate is thought to range between 10 - 14.8/100Ha according to the Glencassley Estate Gamekeeper.

8.6.53 Annual culls are set to maintain the current sporting business and help to maintain designated sites in favourable condition. Over the cull period, there is proposed to be a gradual increase in deer numbers (mainly stags) over the period of the plan to bring the population closer to the target level of 20.2/100Ha (based on the ESG DMP), although according to the Glencassley Gamekeeper, the target level would realistically be less than this figure. The cull is re-assessed annually based on deer observations and habitat monitoring and would follow the scheduled helicopter count in 2021.

8.6.54 Further details are provided within Technical Appendix 8.9 (Deer Management Plan).

Scoped out of Further Assessment

8.6.55 Following the systematic scoping rationale presented in Technical Appendix 8.6, the following ecological features are considered of Local Importance or below, and thus not considered to be IEFs, and have therefore been scoped out of further assessment:

- Designated sites: Caithness and Sutherland Peatlands SAC [depressions on peat substrates of the *Rhyncosporion*; very wet 'quaking' mires; clear-water lochs with aquatic vegetation and poor to moderate nutrient levels; acid peat-stained lakes and ponds; and marsh saxifrage]; Caithness and Sutherland Peatlands SAC [Strath an Loin SSSI component], Kyle of Sutherland Marshes SSSI and Ben Moore Assynt SSSI;
- Habitats: Ancient woodland plantation, wet heath, dry heath, acid flush, marshy grassland, poor semi-improved and semi-improved grassland, native mixed plantation woodland, planted coniferous woodland;
- Protected and notable species: bats (roosting), badger, red squirrel, pine marten, wildcat, mountain hare, red deer, common lizard, adder, slow worm, common toad, common frog, palmate newt, brown trout.

8.6.56 Ecological features that are scoped out of the assessment are identified in Table 8.6.1a/b and Table 8.6.2 (Technical Appendix 8.6)**.**

8.6.57 Although the above ecological features have been scoped out of further assessment within this Chapter, measures to mitigate or avoid potential effects on these features have been included within Embedded Mitigation to help ensure legislative compliance of works as well as adherence to accept industry good practice (see Section 8.7).

Summary of Important Ecological Features

8.6.58 Ecological features that are scoped into the assessment (i.e. those of sufficient importance occurring within a relevant ZoI) are summarised in Table 8.10, along with a summary of the explanation behind their inclusion.

Table 8.10: Likely Effects, Zone of Influence and Justification for Scoped in 'Important Ecological Features'

Ecological Feature	Importance – Legislation and Policy	Importance - Site	Environmental changes and likely significant effects	Zone of Influence	Relevant assessment criteria and scoped in justification
River Oykel SAC: Atlantic salmon and freshwater pearl mussel	International	Local	Indirect effects due to effects on host fish species (salmonids); and degradation of habitats due to pollution/siltation.	River catchments (River Cassley) that intersect the Site	The River Cassley, which is part of the River Oykel SAC, is designated for its freshwater pearl mussel and Atlantic salmon importance, and flows approximately 1.3km from the site's western boundary (1.8km from nearest turbine). All of the watercourses from the site drain into the River Cassley. No construction or operational work is planned within the SAC itself. However, construction and operational work will take place in upstream catchments.
Caithness & Sutherland Peatlands SAC Blanket bog and wet heath	International	International	Reduction in habitat quality as a result of hydrological connectivity and pollution incidents	River catchments (River Cassley) that intersect the Site	The Caithness and Sutherland SAC Grudie Peatlands SSSI component abuts the Site along its northern boundary and is approximately 30m from the Site boundary. The SAC is designated for its blanket bog communities. Given the proximity of the site to the Proposed Development there are potential effect pathways associated with hydrological connectivity and displacement of deer during the construction phase, which could lead to reduction in habitat quality of the SSSI blanket bog feature.
Grudie Peatlands SSSI (SAC component)	National	National	Indirect disturbance/ displacement of local deer population during construction works, and resultant impacts to blanket bog communities	Within the construction/ maintenance/ decommissioning area	
Caithness & Sutherland Peatlands SAC: Otter	International	Local	Habitat loss	Non-breeding resting sites: 30m from the proposed construction/ maintenance area (based on NatureScot's protected species advice)	The Proposed Development footprint is outwith all areas specifically designated for otter populations; however, the Site is within the home range (up to 32km) of otters from this designated site and therefore construction activity may give rise to the disturbance of individuals within the SAC population and there may be impacts to their prey species – either from the placement of infrastructure or due to indirect effects such as noise. Evidence of otter activity was recorded along a number of watercourses and waterbodies within the Study Area, in the form of spraints, paths, prints, feeding remains, and resting sites. The Proposed
			Disturbance/ displacement		

Ecological Feature	Importance – Legislation and Policy	Importance - Site	Environmental changes and likely significant effects	Zone of Influence	Relevant assessment criteria and scoped in justification
			Temporary severance of otter habitat and commuting routes	Within the construction/ maintenance/ decommissioning area	Development could therefore lead to temporary habitat severance and fragmentation of territories during construction or decommissioning phases, particularly during the construction of water crossings.
			Injury / direct mortality	Within the construction/ maintenance areas	
			Reduction in habitat quality as a result of pollution incidents	River catchments (River Cassley) that intersect the Site	
Blanket bog	International	Regional	Direct loss and temporary damage to terrestrial habitats	Within the construction/ maintenance areas	Blanket bog communities are a restricted and declining habitat in the UK and Europe. Blanket bog is a SBL Priority habitat and includes habitats / vegetation communities listed in the Habitats Regulations.
			Indirect disturbance and changes to composition of plant communities resulting from hydrological change	10m beyond construction/ maintenance areas	
Bats (Commuting and foraging)	International	Local	Disturbance and/ or displacement of commuting and foraging bats	Within the construction/ maintenance areas	All bat species in Scotland are classified as European protected species and are listed within the SBL as species of principal importance for biodiversity conservation. Bat activity surveys carried out during 2020 identified at least four species of bat utilising the site for commuting and foraging purposes. These include common pipistrelle, soprano pipistrelle, *Myotis* species, and brown long-eared bat. Based on levels of activity recorded, the site is

Ecological Feature	Importance – Legislation and Policy	Importance - Site	Environmental changes and likely significant effects	Zone of Influence	Relevant assessment criteria and scoped in justification
					considered to support a locally important population of bat species. The Proposed Development could therefore lead to temporary disturbance and/or displacement of commuting and foraging bats during construction or decommissioning phases, particularly in areas close to watercourses.
		Local	Direct effect in the form of injury/ mortality from collision with turbines during the operational phase.	Within the turbine envelope	Bat activity surveys identified at least four species of bat utilising the Site for commuting and foraging purposes. These include common pipistrelle, soprano pipistrelle, *Myotis* species, and brown long-eared bat. In accordance with SNH *et al* (2019), common and soprano pipistrelle are classified as being at high risk of collision with wind turbines. The Proposed Development therefore has the potential to cause direct injury and/or mortality to bats during the operational phase.
Water vole	National	Local	Habitat loss	Within the construction/ maintenance areas	In Scotland, features that water vole utilise as places of shelter or protection are legally protected. The water vole is also listed within the SBL as a species of principal importance for biodiversity conservation. Field surveys identified the presence of both 'potential' and 'active' water vole habitat within the Study Area. The Proposed Development could therefore lead to habitat loss and deterioration during construction or decommissioning phases, particularly during construction of watercrossings. Suitable water vole habitat has been recorded within marshy grassland adjacent to watercourses within the Study Area. The installation of access tracks and watercrossing points during the construction phase therefore has the potential to cause fragmentation of connecting water vole habitat. Active water vole colonies have been avoided by design; however, given that the local water vole population is likely
			Injury and direct mortality		
			Severance/ habitat fragmentation		
			Reduction in habitat quality as a result of pollution incidents	River catchments (River Cassley) that intersect the Site	

Ecological Feature	Importance – Legislation and Policy	Importance - Site	Environmental changes and likely significant effects	Zone of Influence	Relevant assessment criteria and scoped in justification
					to be dynamic in terms of animal numbers and colony locations, there is potential that the colony location/extent may alter prior to construction commencing. The construction of watercourse crossings therefore has the potential to result in the disturbance of water vole, damage or destruction of burrows, and/or killing or injuring of individual water voles.

8.7 Mitigation Embedded into the Development Proposals

Mitigation by Design

8.7.1 An iterative design process has been carried out and a range of mitigation measures have been embedded into the Proposed Development, as outlined in Chapter 2: Site Selection and Design Evolution; and Chapter 18: Schedule of Mitigation.

Land take and Design Optimisation

8.7.2 Ecological features have been considered at all stages of the design, from early feasibility to final layout. This has helped to avoid or greatly reduce impacts on IEFs and other ecological features.

8.7.3 Site infrastructure has been designed as far as reasonably practicable to use the minimum land take. For instance, all access track has been designed to be linear, without loops, to avoid creating islands of habitat fragmentation.

8.7.4 The layout of the Proposed Development has, where possible avoided peatland habitat, and where avoidance has not been possible, has been designed to avoid habitats of highest ecological importance and highest sensitivity to effects.

8.7.5 The proposed borrow pit search areas, the substation, temporary construction compound and storage/laydown areas have been sited to avoid sensitive vegetation communities.

8.7.6 The layout of the wind turbines and other infrastructure has been designed to ensure that areas of blanket bog vegetation, and in particular, the most sensitive areas of vegetation have been avoided as far as possible. This process has been informed by the NVC survey data, Peatland Condition Assessment (PCA) (Technical Appendix 8.2A) and Vegetation Survey at turbine locations (Technical Appendix 8.2B), with preference for development avoiding blanket bog or in areas broadly categorised as modified/drained or actively eroding, and upon areas of shallower peat.

8.7.7 Technical Appendix 8.2B provides details of a vegetation assessment at all turbine locations during the initial design stage. Annex 1 provides a breakdown of all evaluated turbine location options, and based on the information presented within the vegetation assessment, helped inform the decision-making during subsequent design workshops. Wherever possible turbines were then sited to ensure that areas of blanket bog vegetation, and in particular, the most sensitive areas of vegetation were avoided as far as possible. Rationale was also presented with respect to the decision-making in terms of the movement or removal of turbines to avoid impacts.

8.7.8 Where avoidance of development in areas of blanket bog has not been possible, the locations have been selected to avoid areas of deep peat, where possible, as detailed in Chapter 11: Geology and Carbon Balance and associated appendices. Where peat depth is >1m, track construction would generally be of a floating design where practicable rather than a cut design, in order to minimise the disturbance to peat. The track design would have due regard to key principles set out in the joint SNH and Forestry Commission Scotland (FCS) guide to floating roads on peat (SNH *et al*., 2010). Measures already taken into account during design include track micro-siting to avoid deep peat, and where required, features would be incorporated into the track, such as hydrological culverts to minimise the potential effects on the hydrological characteristics of blanket bog and wet heath habitat. Further details of hydrological mitigation to reduce the significance of

potential adverse effects on the hydrology are described in Chapter 10: Hydrology and Hydrogeology.

8.7.9 Another key design consideration has been the avoidance of habitats with potential groundwater dependency, which has been largely achieved by siting the majority of the Development outwith habitats that a potential dependency on groundwater (GWDTEs) and making use of existing tracks associated with the operational Achany Development. Additionally, one of the borrow pits previously disturbed for the construction of Achany Wind Farm would be re-used.

Watercourse crossings

8.7.10 The sensitive designs (e.g. of watercourse crossing and culverts) presented in Chapter 3: Description of Development of this EIA Report have been developed to safeguard the water environment and will help effectively mitigate construction-related direct and indirect impacts to fish and other aquatic features. The Proposed Development has been designed to minimise watercourse crossings.

8.7.11 Seven points were confirmed as 'natural watercourses' and represent the watercourse crossing points of the Proposed Development.

- Two watercourse crossings will span relatively large watercourses across the Allt Bad an t-Sagairt, and across the Allt an Ràsail. SEPA guidance typically requires that single span structures be designed where feasible, especially for larger watercourse crossing widths where a bridge design would typically be considered more appropriate.
- At the remaining five watercourse crossing locations, it has been assumed that the proposed watercourse crossings could constitute culverts with construction on the bed or banks of the watercourses only.

Watercourse buffers

8.7.12 The layout of the Proposed Development has also been designed with a buffer of 50m around watercourses and waterbodies, where possible, excluding watercourse crossings, in order to minimise construction risks on the aquatic environment.

Bat habitat features

8.7.13 In line with current guidance (SNH *et al*., 2019) turbines will be positioned at least 50m (measured from blade-tip) from any features (i.e. key watercourses and woodland edges) likely to be used by commuting and foraging bats to reduce collision risk. Buffer distances have been applied during the design phase in order to avoid areas of habitat with potential to be utilised by commuting and foraging bats. Buffer distances were estimated using the following formula:

$$b = \sqrt{(50 + bl)^2 - (hh - fh)^2}$$

(Where *b* = buffer distance; *bl* = blade length; *hh* = hub height; *fh* = feature height [all in metres])

8.7.14 The buffer distance for the Proposed Development has been calculated as 84.9m, based on a turbine hub height of 81.9m, blade length of 68m and a feature height for

watercourses at ground level (no woodland features are recorded within a buffer distance of the turbines). All turbines would therefore be located at least 84.9m away from habitat features to ensure there is a suitable buffer between turbine blade tips and any habitat feature that may be utilised by commuting and foraging bats.

8.7.15 Table 8.11 outlines how embedded mitigation measures (project assumptions) implemented during construction and operational phases of the Proposed Development would influence the ecological assessment.

Table 8.11: Summary of Embedded Mitigation Measures

Important Ecological Feature	Changes and Effects	Embedded Mitigation Measures and Influence on Assessment
Construction Phase:		
Caithness & Sutherland Peatlands SAC **Grudie Peatlands SSSI** **Blanket bog**	Direct habitat loss and temporary disturbance during construction	The following measures would be incorporated in order to minimise construction effects to blanket bog and other sensitive terrestrial habitats: • Site supervision would be provided by a suitably experienced Environmental Clerk of Works (ECoW), who would be responsible for ensuring the successful implementation of embedded measures, including pollution prevention (see below), monitoring of buffers around construction areas and reference to areas of high ecological sensitivity, and adherence to current construction good practice; • Pre-construction surveys of all works areas over blanket bog would be undertaken by a suitably qualified ECoW to identify locations of any rare bog species (notably dwarf birch and dwarf juniper) and propose suitable avoidance buffers, or consideration of translocation elsewhere within the Site as necessary; • As part of an overarching CEMP, a Peat Management Plan would be developed and submitted pursuant to an anticipated condition of the deemed planning permission (an outline CEMP is provided in Technical Appendix 3.1), in consultation with a suitably experienced peatland Ecologist, Hydrologist and the relevant consultees, in advance of construction works commencing. This would include the method of removal and storage for vegetated turves and peat together with good practice reinstatement measures for the re-use of excavated peat within the Site; • Best practice techniques of vegetation and habitat reinstatement would be adopted and implemented in areas of disturbed vegetation, such as cut track sides, cranepads, substation and borrow pits. Early reinstatement of all disturbed areas would be undertaken to minimise the effects of soils and peat exposure erosion. Any plant material used in reinstatement techniques would be of local provenance and be appropriate for locations being restored. Lessons learned from habitat reinstatement at other SSE upland wind farm sites, e.g. Fairburn, Dumnaglass, and Gordonbush would be used to inform suggested approaches and increase the likelihood of success. Reinstatement techniques would be agreed in consultation with relevant consultees before construction operations begin; and • A Habitat Management Plan (HMP) (Technical Appendix 8.10) would be implemented with the aim of ensuring successful restoration of affected blanket bog and wet heath within the Glencassley Estate. The HMP would be submitted pursuant to a condition of the deemed planning permission, following consultation with NatureScot and SEPA.

Important Ecological Feature	Changes and Effects	Embedded Mitigation Measures and Influence on Assessment
Otter, **Atlantic salmon,** **Freshwater pearl mussel**	Silt/sediment and pollutant release, damaging fish habitats (inc. spawning habitat), potentially harming fish and associated adverse effects on fish and otter populations.	The following measures as outlined in Chapter 10: Hydrology and Hydrogeology have been incorporated in order to ensure that water quality within the Site is maintained and the risk of pollution and sedimentation are controlled or reduced wherever possible: • To comply with the Controlled Activities Regulations (CAR) it is anticipated that a Construction Site Licence (CSL) would be required. The application for a CSL would be supported by a Pollution Prevention Plan (PPP) and Pollution Incident Response Plan (PIRP) which would be subject to consultation with SEPA in advance of any construction activities. This would set out site management and working practices and draw heavily upon SEPA's Guidance for Pollution Prevention (GPPs); • All watercourse crossings would be designed in accordance with the SEPA Good Practice Guide for the Construction of River Crossings (2010). Where culverts are required, these would be designed in accordance with the CIRIA Culvert Design and Operation Guide (2010); • Specially designed silt traps would be used to reduce potential impacts of sedimentation on downstream aquatic habitats; and • A construction area stand-off of at least 50m radius has been applied to all watercourses (except for watercourse crossings). The layout has been designed to minimise the number of crossings.
Atlantic salmon, **Freshwater pearl mussel**	Obstruction of migration and associated adverse effects on fish spawning and recruitment. Risk of harm to fish during works at watercourse crossings	Watercourse crossing designs/construction would be informed by SEPA Good Practice Guide for the Construction of River Crossings (SEPA 2010b) and CIRIA Culvert Design and Operation Guide (CIRIA 2010). Bridged watercourse crossings would be used where feasible/practicable.
	Loss/ severance of, or damage to, watercourse habitat at watercourse crossings, including associated adverse effects on fish spawning and recruitment	Watercourse crossing would be micro-sited to avoid unconsolidated gravel and pebble substrates and riffle habitats. Culvert construction would be supervised by the ECoW, with culverts transferred to watercourse crossings intact, avoiding mixing concrete near to watercourse crossings. Culverts would be sunk in and angled so as not to prohibit fish passage. With the exception of work at watercourse crossings a buffer/exclusion zone (50m radius) around watercourses would be implemented.
	Silt/sediment and pollutant release, damaging fish habitats (inc. spawning habitat),	With the exception of work at watercourse crossings, a buffer/exclusion zone (50m radius) around the watercourse network would be implemented. Additional measures to minimise the risk of pollution sediment release to

Important Ecological Feature	Changes and Effects	Embedded Mitigation Measures and Influence on Assessment
	potentially harming fish and associated adverse effects on fish populations	watercourses are set out in detail in Chapter 10: Hydrology and Hydrogeology. Pollution prevention measures would be detailed within the CEMP and would be implemented as part of the CAR licensing requirements.
	Noise and vibration and associated harm to fish	With the exception of watercourse crossings (construction and operation), a buffer/exclusion zone (50m radius) around the watercourse network would be implemented, which would minimise noise/vibration effects on fish. Construction of watercourse crossings would be completed over a period of short duration and taking care to minimise noise/vibration, such as avoiding impacts between plant and riverbed/bank substrate and carefully lowering culverts into place.
Otter **Water vole**	Disturbance, Kill /injure /destroy habitat, affect distribution.	The CEMP would include Species Protection Plans (SPP) for otter and water vole, which would be prepared to ensure compliance with legislation. These would include details of pre-construction surveys to check on the presence of otters and water voles and the incorporation of appropriate work exclusion buffers, including a 10m buffer around active water vole habitat. Where works may be required within these exclusion buffers a licence would be required form NatureScot prior to further commencement. The following suite of embedded mitigation would also be implemented across the Site to avoid causing harm to, or disturbing these species: • During normal working hours throughout the construction period the ECoW would be on-site to ensure that all environmental measures relevant to otter and water vole are delivered and ensure compliance with legislation; • All works in proximity to waterbodies / watercourses would follow measures outlined in the CEMP/ PPP to ensure their complete protection against pollution, silting and erosion; • Culverts would be fitted with mammal ledges and a suitably textured ramp extending to the level of the road; • Strict speed limits (15mph) would be followed on access tracks during all phases of development; • Trenches, holes and pits would provide a means of escape for otters (and other fauna) that may become entrapped. Any temporarily exposed pipes would be capped when contractors are off-site to prevent otter from gaining access; • Any lighting used to accommodate such works must be positioned to minimise light spill onto watercourses/ waterbodies; • An emergency procedure would be implemented by site workers if an otter is encountered. All works within 30m would cease as soon as it is safe to do so, and the ECoW would inspect the Site and define appropriate measures (if required).

Important Ecological Feature	Changes and Effects	Embedded Mitigation Measures and Influence on Assessment
Bats	Disturbance and/ or displacement of commuting and foraging bats	• Directional lighting and light spill within 50m of the Allt an Rasail and Allt Bad an t-Sagairt (both of which providing suitable foraging/commuting habitat) would be avoided during the hours of darkness (taken to be 30 minutes before sunset to 30 minutes after sunrise). No security lighting to be left on in-situ overnight where practicable; and • Turbines would be sited at least the minimum recommended distance from suitable habitat features (equating to a stand- off area of 50m from blade tip to habitat feature), based upon the calculation set out in paragraph 8.7.13) and in accordance with current guidance (SNH *et al*., 2019).
Operational Phase		
Atlantic salmon, Freshwater pearl mussel, otter and water vole	Pollution	The majority of the specific measures applied during ongoing and operational activities relate to the application of good practice in terms of managing and controlling activities to minimise the risk of pollution upon receptors and hydrological features. A detailed explanation of the general site pollution control, emergency procedures and contingency planning is set out within Chapter 10 and the CEMP (as outlined in Technical Appendix 3.1). The potential risks to surface water during operation are likely to be limited and localised based on the planned turbine servicing works and the nature and volume of potentially polluting substances required. The operator would ensure a site-specific risk assessment is completed and that control measures are implemented to ensure all environmental risks are minimised. Storage, use and disposal of oils would be in accordance with good practice and SEPA guidance.
Otter **Water vole**	Disturbance, Kill /injure /destroy habitat, affect distribution.	All operational and maintenance work requirements would be undertaken within working areas clearly defined in advance of works and the storage of materials would be restricted to areas of hardstanding e.g. permanent tracks, crane pads or substation and control building, and associated infrastructure.
Bats	Direct effect in the form of injury/ mortality from collision with turbines/risk of barotrauma during the operational phase.	Good practice environmental measures would be adopted to minimise the risk of bats colliding with turbines during operation, in accordance with current guidance (SNH, 2019). Turbines will have a minimum 50m separation distance between blade tips and high-value bat habitats, such as woodland and riparian features. Although this offset has been included in the design of the Proposed Development, this standoff buffer will be maintained throughout the operational life of the Proposed Development by ensuring that tree regeneration does not encroach on the buffer.
Decommissioning Phase		
All ecological features	Similar changes and effects to construction phase	During the decommissioning of the Proposed Development, potential effects on ecological features are expected to be similar to those encountered during the construction phase and therefore similar environmental measures would be required. Any new legislation published prior to decommissioning would be adhered to and incorporated into a Decommissioning Plan, prior to decommissioning taking place.

8.8 Potential Effects

8.8.1 This section considers the potential impacts and associated effect significance of the construction, operation and decommissioning of the Proposed Development based on the typical activities described in Chapter 3: Description of Development.

Construction Effects

8.8.2 The assessment of likely effects associated with the construction of the Proposed Development is based on the activities described in Chapter 3: Description of Development.

Designated Sites

River Oykel SAC

8.8.3 In light of the NatureScot survey data there is no evidence that the Proposed Development poses a significant threat to any freshwater pearl mussel populations. However, water from all the Site's watercourses ultimately ends up flowing into the important downstream River Cassley catchment. On this basis, the Allt an Rasail / River Cassley catchments would be considered 'sensitive' in respect to proposed construction method statements, managed through the CEMP (Technical Appendix 3.1**)**.

8.8.4 The main potential interaction between the Proposed Development and the River Oykel SAC features concerns potential pollution/runoff from the Site, which could end up in the River Cassley and the River Oykel SAC. The main sources of pollution would be fuel oil and/or chemical discharges from storage facilities and/or escapes from damage to fuel tanks in vehicles or sediment runoff from watercourse crossings. Instances such as these could lead to a sudden pulse of pollutant, which, if not readily controlled, might enter the aquatic environment and ultimately flow downstream into the River Oykel SAC.

8.8.5 The magnitude of a pollution event from the Site on the downstream internationally important River Oykel SAC is assessed as High if it occurs, causing significant effects. However, the CEMP and PPP will set out how suitable pollution prevention measures will be adopted to prevent pollution of the River Oykel SAC. The ECoW will also have an important role in ensuring compliance and implementation of all work plans. This mitigation is embedded within the design process (See Table 8.10) and, assuming that the measures are implemented correctly, **no significant effects** are likely on the River Oykel SAC Atlantic salmon and freshwater pearl mussel features.

8.8.6 These impacts are considered further in relation to the SAC's Conservation Objectives in Technical Appendix 8.8: Habitats Regulations Appraisal.

Caithness & Sutherland Peatlands SAC/Ramsar and Grudie Peatlands SSSI

8.8.7 Caithness & Sutherland Peatlands [Grudie Peatlands SSSI component] is situated approximately 30m to the north-east of the nearest access track and 45m to the north-east of the nearest working area of a turbine (T18). No land-take will occur in the SAC/Ramsar/SSSI site and no indirect habitat loss would be anticipated given that all construction and operational work will take place downslope in the Cassley catchment and not over the section of the catchment where the SAC/Ramsar SSSI sites are located. Provided construction method statements prepared in support of the CEMP (Technical Appendix 3.1) are properly implemented and given that all construction work will occur in the River Cassley catchment, potential indirect impacts, such as upslope changes in

hydrology and drainage will not affect any of the above designated sites. On this basis, potential hydrological effects are not anticipated and therefore **not significant**.

8.8.8 The construction phase for the Proposed Development is anticipated to last for approximately 18 months. During this period, deer that would generally utilise habitats within the Site would be expected to be displaced as a result of construction activities, which could contribute to increased grazing/trampling pressure on adjacent SSSI habitats to the north-east of the Proposed Development. However, continuous disturbance would not be expected from all locations at all times and different activities are likely to have different levels of disturbance dependent on the topography of the land or line of sight. It is anticipated that deer would be most likely be displaced a couple of hundred metres away from personnel and any active construction works and would be expected to return to the construction area once activities have ceased.

8.8.9 Deer have some basic requirements, which can be summarised simply as food and shelter. So long as these are provided then deer are relatively predictable in terms of their needs. If a wind farm is developed in a manner that prevents deer from gaining access to traditional sources of food or shelter, then deer are likely to move elsewhere in search of these resources.

8.8.10 Glencassley Estate actively manage the red deer population in collaboration with the wider East Sutherland DMG and therefore have knowledge of where the deer seek food and shelter throughout the year. Technical Appendix 8.9 details the population of red deer utilising the main site and wider Study Area. The following summarises their habits and general distribution.

8.8.11 Deer tend to move into and out of the hill, spending evenings and night down in the fields around the River Cassley, before moving up into the hill (within the Site) through the day. In addition to which, there is very little lateral movement of deer up and down the glen (See Figure 8.9.2 - Technical Appendix 8.9). In broad terms, heavier grazing and trampling are generally found along the routes in and out of the hill rather than widespread in nature across the Estate. Within the Estate, the biggest concentration of deer are generally found between Badintagairt and the woodland around Glencassley Castle where the best quality grassland is found. [Pers. Comm. Glencassley Estate Gamekeeper].

8.8.12 Practical experience from SSE development sites elsewhere suggests that localised temporary displacement of deer can sometimes occur around construction sites whilst work commences, dependent upon how habituated or scared of humans the deer are. However, the Proposed Development will not prevent deer gaining access to favoured sources of food or shelter, detailed in Section 8.8.10. Consequently, there is no evidence to suggest that deer behaviour will change in the long-term if the Proposed Development is built.

8.8.13 In conclusion, whilst there is evidence (See Technical Appendix 8.9) that construction work may cause very localised and temporary displacement of red deer, this ceases when construction ends. In addition to which, based on a proposed phased approach to construction (See Chapter 3: Description of Development), working areas would be localised rather than comprising the entirety of the Proposed Development area, further limiting the potential for wider dispersal. There is no evidence that large scale construction projects in the uplands affect deer movements and behaviour in the short, medium or long-term. Therefore, there is no evidence to suggest the Proposed Development is likely to cause any substantial or significant changes in deer movements and behaviour on Glencassley or adjacent estates. In light of this, the magnitude of

potential deer displacement during construction on the SAC/SSSI blanket bog habitats would be considered **low** and therefore **not significant.**

8.8.14 These impacts are considered further in relation to the SSSI's Conservation Objectives in Technical Appendix 8.8: Habitats Regulations Appraisal.

Habitats

8.8.15 The Proposed Development would result in permanent habitat loss due to land take (prior to any habitat reinstatement) associated with the construction of access tracks, wind turbine foundations, crane pads, construction compounds and other associated infrastructure (Further details are provided in Technical Appendix 8.7).

8.8.16 A total of seven turbine locations are located on blanket bog habitat, NVC communities M17a, M17b or M19 (six of these turbine locations are located on the edge of these vegetation communities, which transition into with wet heath communities) with a further three on wet heath/blanket bog (M15/M17).

8.8.17 Table 8.11 and Table 8.12 set out the percentage of permanent and temporary habitat loss by habitat type within the study area, respectively. Direct habitat loss during construction includes the working areas for each turbine site (turbine base and hardstanding area), the area of proposed new stone track, the working areas for the substation, Lidar unit and temporary development areas. Indirect habitat modification is calculated as a 10m buffer around the areas of direct habitat loss as this is considered to represent the worst-case scenario of habitat that is likely to be indirectly modified by the Proposed Development.

8.8.18 As well as direct habitat losses, areas have been identified where temporary habitat loss would be expected during construction, including temporary laydown areas and construction compounds. Additionally, those areas surrounding built infrastructure which will be subject to physical disturbance (for drainage ditches, cable trenches, banked cut faces/batters etc.) would be subject to a 4m buffer surrounding infrastructure to allow machinery to work outwith the permanent footprint of any infrastructure component. These areas would be subject to restoration as detailed in the outline CEMP (Technical Appendix 3.1).

8.8.19 Habitat losses are broken down by Phase 1 habitat types in Table 8.12 and Table 8.13; and by NVC communities and wind farm component in Table 8.7.3 (Technical Appendix 8.7).

Table 8.12: Habitat Loss from Proposed Permanent Development During Construction

		Direct Habitat Loss		Indirect habitat modification	
Habitat	**Total Habitat in Study Area (Ha)**	**Area lost (Ha)**	**Percentage loss (%)**	**Area modified (Ha)**	**Percentage modified (%)**
Blanket bog	278	4.52	1.63%	13.05	4.69%
Wet dwarf shrub heath/ Blanket bog mosaic	44	2.523	5.73%	5.47	12.43%
Wet dwarf shrub heath	458	9.355	2.04%	20.47	4.47%
Dry dwarf shrub heath	20	0.343	1.715%	0.94	4.7%

		Direct Habitat Loss		Indirect habitat modification	
Acid flush	2	0.016	0.8%	0.054	2.7%
Dry heath/acid grassland mosaic	6	0.032	0.53%	0.088	1.47%
Acid grassland	22.9	-	-	0.006	0.026
Marshy grassland	94	1.39	1.48%	3.37	3.59

Table 8.13: Habitat Loss from Proposed Temporary Development During Construction

		Direct Habitat Loss	
Habitat	**Total Habitat in Study Area (ha)**	**Area lost (ha)**	**Percentage loss (%)**
Blanket bog	278	10.89	3.92%
Wet dwarf shrub heath/ Blanket bog mosaic	44	4.82	10.95%
Wet dwarf shrub heath	458	28.82	6.29%
Dry dwarf shrub heath	20	1.19	5.95%
Acid flush	2	0.034	1.7%
Dry heath/acid grassland mosaic	6	0.0681	1.135%
Acid grassland	22.9	-	-
Marshy grassland	94	3.474	3.7%

8.8.20 A Peatland Condition Assessment (Technical Appendix 8.2) provides an additional approach for helping to determine peatland condition and therefore helping to avoid or reduce impacts to the best quality blanket bog habitat. This approach considers presence of all peatland habitats including blanket bog, as well as wet heath and dry heath. Based on the categories outlined in Table 8.14 and Table 8.15, the best quality blanket bog comprises either Near Natural or Modified (Near Natural). The following calculations are based on peatland habitats comprising both blanket bog and heathland communities.

Table 8.14: Habitat Loss from Proposed Permanent Development During Construction – Peatland Condition Categories

		Direct Habitat Loss (Ha)		Indirect habitat modification	
Peatland Condition Assessment Categories	**Total Habitat in Study Area (ha)**	**Area lost (Ha)**	**Percentage loss (%)**	**Area modified (Ha)**	**Percentage modified (%)**
Modified	664	13.01	**1.96%**	29.78	**4.48%**
Modified/Drained	27.4	0.97	**3.54%**	2.72	**9.93%**
Modified/Drained/Actively Eroding	81.8	2.05	**2.51%**	5.38	**6.58%**
Modified (Near Natural)	11.6	0.12	**1.03%**	0.44	**3.79%**

		Direct Habitat Loss (Ha)		Indirect habitat modification	
Near Natural	13.3	0.23	**1.73%**	0.72	**5.41%**

Table 8.15: Habitat Loss from Proposed Temporary Development During Construction – Peatland Condition Categories

		Temporary Habitat Loss	
Peatland Condition Assessment Categories	**Total Habitat in Study Area (Ha)**	**Area lost (Ha)**	**Percentage loss (%)**
Modified	664	39.85	**6%**
Modified/Drained	27.4	1.35	**0.18%**
Modified/Drained/Actively Eroding	81.8	2.97	**3.63%**
Modified (Near Natural)	11.6	0.14	**1.21%**
Near Natural	13.3	0.21	**1.58%**

8.8.21 As outlined in Section 8.8 and supported by Technical Appendix 8.2B (Vegetation Assessment of Turbine Locations), preference has been given to construct on the least sensitive habitats wherever possible (See Annex 1).

8.8.22 Based on calculations provided in Table 8.12, the direct loss of blanket bog (combined with area of potential indirectly modified blanket bog) would comprise 25.56 Ha of the total recorded in the study area. As a precaution, these calculations also include transitional wet heath/blanket bog habitat. Based on the calculations provided in Table 8.13, the temporary loss of blanket bog would comprise 15.71Ha of the total recorded in the study area.

8.8.23 Table 8.6.4 (Technical Appendix 8.6) illustrates that of the recorded peatland habitats within the Study Area, approximately 1.67% and 1.45% comprise higher quality blanket bog communities ('Near natural' or 'modified/near natural' respectively). Of these communities 1.4% of the near natural/modified near natural resource on site would be permanently lost.

8.8.24 The effects of this would be minimised through the implementation of good practice embedded mitigation (Table 8.11), including proposals for full habitat re-instatement of temporarily disturbed habitat and the re-use of excavated peat within the Site (Details are provided in Chapter 11 and Technical Appendix 11.3 – Peat Management Plan). This would be a medium magnitude of change affecting 7.94% (up to 12.82% including temporary disturbance) of the blanket bog vegetation within the Study Area, which is assessed as being of Regional importance for this habitat.

8.8.25 Whilst vegetation within the disturbed areas would be expected to recover in the medium to long-term, the overall effect in the absence of further mitigation is considered to be **Significant.**

8.8.26 The assessment of local hydrology (Chapter 10: Hydrology and Hydrogeology) states that measures would be included to ensure that pre-development runoff rates are maintained and that rates of runoff to watercourses are not increased. Effects would be further minimised through the implementation of proposals (Table 8.11) for full habitat re-

instatement or restoration of temporarily disturbed habitat and the re-use of excavated peat within the Site. The Proposed Development is therefore anticipated to cause temporary (short-term) change to the local hydrology regime (low magnitude), with likely short-term changes in the composition of blanket bog vegetation of between County and Regional Importance up to ten metres from proposed infrastructure. Although the magnitude and duration of the impact would depend on the nature of the pollution event, based on a precautionary approach, it has been considered to result in an adverse effect at the local level but this effect is considered to be **not significant**, particularly as the effect would be localised to watercourse crossing areas, with most standing or running water habitat protected from construction activities by a 50m buffer.

Protected Species

Otter

8.8.27 The survey identified limited but widespread evidence of otter activity along watercourses and riparian habitat within the Study Area. A total of three resting places (two couches and one holt) and three potential resting places (one potential couch and two potential holts) were recorded within the Study Area. No natal holts or high value foraging areas were recorded. The nearest resting site was on the Allt an Rasail, approximately 225m from the nearest construction area. As such, the magnitude of impact with respect to the loss of suitable resting sites is negligible and therefore **not significant**.

8.8.28 Given the distance from the nearest working areas, no otter resting sites within the Site study area or SAC would be affected. However, individual otters supporting the SAC population will range between catchments connecting the Site and the SAC.

8.8.29 The presence of the most well-used otter travel routes (primarily the Allt an Rasail and Allt Bad an t-Sagairt) were identified within the site and the location of these and resting sites were taken into account when designing the Proposed Development, to avoid potential disturbance of these features wherever possible. This included:

- The number of watercourse crossings (two bridge crossings and five culverted crossings) was kept to a minimum to reduce the risk of disturbance to and pollution of watercourses;
- All turbines and associated infrastructure have been located wherever possible a minimum 50m from watercourses; and
- All construction works areas have avoided recorded resting sites. The nearest resting site was recorded approximately 225m from the nearest construction area.

8.8.30 Due to the extent of available watercourses/waterbodies and the extensive foraging and commuting habitat within the Study Area that will remain undisturbed during construction and decommissioning, the availability of foraging habitat resource is not considered to be a limiting factor within the Site. In light of this and the embedded mitigation outlined in Table 8.11, construction related disturbance/displacement effects to otters within the Site would therefore be temporary and sporadic, and the magnitude of change would be low and therefore considered **not significant**.

8.8.31 There is also potential for construction activities to cause fragmentation of otter habitat and prevent the free movement of otters across their territories.

8.8.32 Access tracks have avoided crossing watercourses where possible, but due to the number of watercourses on the Site, and limitations regarding access locations, it is not possible

for the development to take place without some being crossed. The Proposed Development includes two bridge crossings and five culverted crossings.

8.8.1 Whilst otters are likely to utilise most watercourses within the site, otter territories are likely to cover many kilometres of watercourses/water bodies, between River Cassley and Loch Shin, much of which would be largely unaffected. Furthermore, the Proposed Development is likely to represent only a very small proportion of an otter's foraging territory, with alternative routes available including overland routes, and as such, works would not be expected to result in permanent blockage of existing commuting routes.

8.8.2 On this basis, and in light of the embedded mitigation outlined in Table 8.11, including the implementation of culverts fitted with mammal ledges to allow free access the temporary loss or barrier effects during the construction of watercourse crossings would result in a low magnitude of change to the otter population and is therefore considered **not significant**.

8.8.3 Construction and decommissioning phases of the Proposed Development would bring vehicles to a previously undeveloped area, and therefore there is potential for otters to be hit by vehicles. However, a CEMP would include a Species Protection Plan (SPP) for otter, which would be prepared to ensure compliance with legislation. This would include details of pre-construction surveys to check on the presence of otter and a suite of embedded mitigation measures (including 10 m work exclusion zones, mammal friendly crossings, and vehicle speed limits of 15 mph) (See Table 8.11). With the adoption of this embedded mitigation, the risk of direct mortality to individuals during the construction and decommissioning phases is low and would result in a low magnitude of change to the otter population and is therefore considered **not significant**.

8.8.4 The Site layout has been designed wherever possible to avoid sensitive otter features including resting sites and paths alongside water courses and their riparian zones, it is also necessary to protect otters' food resource by avoiding pollution to the watercourses from the Proposed Development. With the adoption of the embedded mitigation detailed in Table 8.11, degradation of food resource by pollution of habitats used by otter, during all phases of the Proposed Development is considered to be neutral. The overall magnitude of change to the otter population is also considered neutral and the resultant effect is considered **not significant**.

8.8.5 The potential impacts on the SAC otter population have also been assessed in Technical Appendix 8.8 against the conservation objectives of the Caithness and Sutherland Peatlands SAC.

Water vole

8.8.6 The Proposed Development has been designed to maintain a 50m buffer from watercourses where possible and has sought to avoid the three recorded active colonies along the upper reaches of the Allt an Rāsail, a minor tributary of the Allt an Rasail and the upper reaches of the Allt Bad na t-Sagairt. The survey also found old, potentially inactive, water vole burrows along the central stretch of the Allt an Rāsail approximately 60m from the nearest watercourse crossing.

8.8.7 In addition to which, based on the existing Achany Wind Farm HMP water vole monitoring surveys (conducted in 2021) seven colonies were recorded, three of which were identified within a 100m of the access track or proposed borrow pit search area. Two colonies were recorded on either side of the existing access track over the Allt a' Bhadain close to the Site entrance from the A839; and a third along an unnamed tributary of the

same water course which approximately 60m from the proposed borrow pit search area (BP1, See Technical Appendix 11.1) located along the eastern extent of the existing Achany access track.

8.8.8 As such, where water vole activity is located particularly in relation to the two colonies on the Allt a'Bhadain, 10m construction exclusion buffer will be marked. If there is a requirement to widen this existing access, and a 10m exclusion buffer was not possible around active water vole burrows in this location, a licence would be required from NatureScot before works could proceed.

8.8.9 Although active water vole colonies have been avoided by design, given that the local water vole population is likely to be dynamic in terms of animal numbers and colony locations year by year, there is potential for them to change colony location prior to construction commencing. Given that there is potential for water voles to establish along watercourses within the Site, mitigation measures detailed in Table 8.11 would be implemented, including pre-construction surveys prior to commencement of construction work and follow-up inspections of riparian habitat by the ECoW.

8.8.10 Given that the spatial extent of construction works likely to impact upon a small area of habitat with potential to support water voles will be localised, following the application of embedded mitigation measures outlined in Table 8.11, the loss of water vole habitat from the Proposed Development is considered to be of Low magnitude and **no significant effects** are predicted.

8.8.11 Noise and visual disturbances are generally considered unlikely to have any significant impacts upon water voles (Dean *et al*., 2016). Nevertheless, construction works at watercourse crossings will be restricted to defined working areas, and where necessary 10m exclusion buffers would be defined around any identified water vole habitat (as advised by the ECoW).

8.8.12 Due to the presence of vehicular traffic on existing and new tracks during the construction phase, there is the potential for injury to animals within the Site. However, a CEMP would include a Species Protection Plan (SPP) for water vole, which would be prepared to ensure compliance with legislation. This would include details of pre-construction surveys to check on the presence of water vole and a suite of embedded mitigation measures (including 10 m work exclusion zones, mammal friendly crossings, and vehicle speed limits of 15 mph) (See Table 8.11) would be implemented across the Site to avoid causing harm to or disturbing this species. Impacts are subsequently considered to be of low magnitude and effects are predicted to be **not significant**.

8.8.13 The design of the seven watercourse crossings, including over the Allt an Rasail will retain free passage of water voles and other wildlife beneath, through the incorporation of mammal ledges (See Embedded Mitigation in Table 8.11). As such, negligible severance or fragmentation of water vole habitat within the Site would occur. Impacts are subsequently considered to be of low magnitude and effects are predicted to be **not significant**.

8.8.14 The outline CEMP (Technical Appendix 3.1) includes all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the construction period, in line with current industry and statutory guidance applicable at the time of commencement of construction activities. In the context of the small area of watercourse network to be affected and the extensive nature of potentially suitable habitat for water voles remaining within the Site and wider Study area, impacts

are subsequently considered to be unlikely and of Low magnitude and effects are predicted to be **not significant**.

Bats

8.8.15 There is potential for disturbance and/ or displacement of commuting and foraging bats during the construction period as a result of increased noise and artificial lighting levels within the Site during hours of darkness.

8.8.16 However, with the adoption of the mitigation measures detailed in Table 8.11, the potential magnitude of change is considered to be very low and the resultant effect on bat populations considered to be **not significant**.

Operational Effects

Designated Sites

8.8.17 The operational phase is not anticipated to involve any works which will directly or indirectly impact water courses within the River Oykel catchment. The potential risks to surface water during operation are likely to be limited and localised based on the planned turbine servicing works and the nature and volume of potentially polluting substances required. The operator would ensure a site-specific risk assessment is completed and that control measures are implemented to ensure all environmental risks are minimised. Storage, use and disposal of oils would be in accordance with good practice and SEPA guidance. Assuming that these measures are implemented correctly, magnitude of change is considered to be negligible and thus **not significant**.

8.8.18 The operational phase is not anticipated to involve any works which will directly or indirectly impact the Caithness and Sutherland Peatlands/SAC or Grudie Peatlands SSSI. Habitat management works (See Technical Appendix 8.10) will take place both on and off-site throughout the lifecycle of the Proposed Development and will likely have a long-term positive impact on the peatland habitats on Site, which may bring benefit to species beyond the boundary of the Site. In light of the above, no significant detrimental operational effects to habitats within these sites are predicted. It is considered that the effects will, at a minimum, be neutral, and thus **not significant**.

Habitats

8.8.19 Operation of the Proposed Development is not anticipated to involve any works which will directly or indirectly impact blanket bog habitat. Habitat management works (See Technical Appendix 8.10) will take place on and off-site throughout the lifecycle of the Proposed Development and will likely have a long-term positive impact on the blanket bog resource on Site. In light of the above, no significant detrimental operational effects on blanket bog habitat are predicted. Although it is reasonable to anticipate that the successful implementation of the proposed measures would result in a positive operational effect. As the scale and success of these measures are yet to be determined, it is considered that the effects will, at a minimum, be neutral, and thus **not significant**.

Protected Species

8.8.20 Maintenance of the Proposed Development is likely to result in occasional vehicle movements and personnel presence throughout the operation of the Proposed Development; however, this activity will be limited to the Development infrastructure and wind turbine generators, with no disturbance of the surrounding environment

(including riparian habitats) expected. Due to the infrequency and localised nature of operational activities, the potential detrimental effect for otters and water vole is considered to be of negligible magnitude and is therefore **not significant**.

8.8.21 The main risk to bats from operational wind farm developments relates to:

- Direct collision with fast-moving turbine blades resulting in trauma injuries; and
- Barotrauma (i.e. internal haemorrhaging in the lungs resulting from rapid changes in air pressure behind moving turbine blades).

8.8.22 The degree of population-level risk and individual risk from collision with wind turbines/barotrauma for those bat species identified to utilise the Site are shown in Table 8.16.

Table 8.16: Level of potential vulnerability of populations of bat species in Scotland

	Collision Risk			
Relative abundance		**Low**	**Medium**	**High**
	Common species			Common pipistrelle Soprano pipistrelle
	Rarer species	Brown long-eared bat Daubenton's bat		
	Rarest species	Whiskered bat Brandt's bat		Nathusius' pipistrelle Noctule Leisler's bat
Table extracted from SNH et al (2019). Yellow – low population vulnerability; Amber – medium population vulnerability; Red – high population vulnerability.				

8.8.23 Results of the bat activity survey indicate that two bat species classified as 'high risk' of turbine collision have been confirmed to utilise the Site – these are common pipistrelle and soprano pipistrelle bats.

Common pipistrelle

8.8.24 In general, the median risk category (Refer to Technical Appendix 8.4) at each location for common pipistrelle was rated as 'low' or 'moderate' throughout the survey season. The only monitoring location assessed as having a median risk level of 'high' was Location M in Spring, which is located within open blanket bog habitat within the south-east of the Site. However, the closest turbine is positioned approximately 700m from Location M (Turbine 20) (Figure 8.4.2).

8.8.25 Table 8.16 illustrates that common pipistrelle is a species of medium population vulnerability that is classified as high risk of collision with wind turbines. Results of the potential collision risk assessment (as required by SNH *et al.*, 2019) indicates that the Site is considered to pose an overall medium collision risk to this species during levels of typical activity, with a high collision risk demonstrated at certain locations (e.g. close to watercourses) during peak levels of activity in Summer and Autumn.

8.8.26 However, through taking into account embedded mitigation of maintaining a minimum buffer distance between turbines and features that may be utilised by commuting and foraging bats (Table 8.11), the potential magnitude of change in terms of risk to populations of soprano pipistrelle is therefore considered to be low and the resultant effect on soprano pipistrelle populations considered **not significant**.

Soprano pipistrelle

8.8.27 Results of the potential collision risk assessment for the Site show a median risk category score of 4, indicating an overall 'low' collision risk to soprano pipistrelle (Table 8.4.12, Technical Appendix 8.4). The maximum risk category score was 12 at Location N, indicating a 'medium' collision risk to soprano pipistrelle during peak levels of activity at this monitoring location. Given the results obtained, the overall collision risk to soprano pipistrelle is considered as '**low'**.

8.8.28 Table 8.13 illustrates that soprano pipistrelle is also a species of medium population vulnerability that is classified as high risk of collision with wind turbines. Results of the potential collision risk assessment indicates that the Site is considered to pose an overall low collision risk to this species during levels of typical activity, and with a moderate risk presented during peak levels of activity. It should however be noted that only one night of moderate activity was recorded at a single monitoring location during the survey period.

8.8.29 Based on the results obtained, and through incorporation of embedded mitigation measures outlined in Table 8.11, the potential magnitude of change in terms of risk to populations of soprano pipistrelle is therefore considered to be low and the resultant effect on soprano pipistrelle populations considered **not significant**.

Decommissioning Effects

Designated Sites

8.8.30 Impacts to the River Oykel SAC and Caithness and Sutherland Peatlands SAC from decommissioning works are anticipated to be of a similar nature to the construction phase impacts and therefore similar mitigation would be required, which would be incorporated into a Decommissioning Plan prior to decommissioning taking place,

Habitats

8.8.31 Decommissioning impacts would involve personnel and machinery accessing locations across the study area to dismantle and remove infrastructure, including turbines, hardstanding and site buildings, as detailed in Chapter 3: Description of Development. The wind turbines and substation would be removed to ground level, with the concrete turbine foundations left in-situ and broken down to approximately 1m below ground level. Substation foundations would also be removed. The access tracks and electrical cables would be left in-situ to minimise habitat disturbance. These impacts would be short-term, intermittent and temporary and last weeks or months at any given location. Existing access tracks would be used to access the infrastructure to be decommissioned. As a result, effects on habitats are predicted to be short term and temporary, with habitats allowed to recover and regenerate following the removal of infrastructure.

Protected Species

8.8.32 Decommissioning activities are considered to be of a similar nature to those of the Proposed Development during construction; therefore, potential exists for direct and indirect effect to otter and water vole, where decommissioning works may take place in close proximity to water courses and riparian habitats. Decommissioning activities may result in a localised increase in noise, vibration, traffic and presence of people, potentially causing disturbance to commuting and foraging otter. Subject to the development and

implementation of a Decommissioning Plan prior to decommissioning taking place, this effect is considered to be of low magnitude and is therefore **not significant**.

8.9 Mitigation

8.9.1 There is the potential for significant adverse impacts arising from construction works to blanket bog habitat. The following outlines additional compensatory habitat restoration measures proposed to address these effects.

Compensatory Habitat Restoration

8.9.2 An Outline Habitat Management Plan (Technical Appendix 8.10) sets out criteria for identifying and delivering compensatory blanket bog habitat management off-site. A core aim of the Achany Extension habitat management proposals in respect to Ecological features considered in this chapter will be to help conserve, enhance and restore degraded or modified blanket bog habitats.

8.9.3 Habitat management proposals will seek to:

- Restore and enhance blanket bog habitat in an area of c. 307 Ha (over seven times greater than the combined predicted habitat loss associated with the Proposed Development), which would involve:
  - The restoration of natural drainage patterns (Figure 8.10.2);
  - Encouraging re-vegetation of the bog surfaces;
  - Monitoring of the bog water table; and
  - Vegetation condition monitoring.
- Work in conjunction with the DMP to ensure sustainable deer numbers in order to improve the quality of blanket bog in the identified management units.

8.9.4 Three off-site candidate management units have been identified within Glencassley Estate, which have been subject to extensive historical drainage and support lower deer densities (See Figure 8.9.2) in comparison with other parts of the Estate. The identification of these candidate areas and determination of likely habitat types and the suitability for restoration has been informed through engagement with the Glencassley Estate gamekeeper, use of aerial imagery, OS mapping and remote-sensed high resolution habitat maps[11].

1. Unit A (c. 43.42 Ha) is situated immediately north-west of Loch Langwell on lower lying ground;
2. Unit B (c. 176.74 Ha) is situated to the east of Allt Dail Faid on gently sloping ground along its western extent and steeper ground along its eastern extent;
3. Unit C (c. 86.73 Ha) is situated further to the north of here and due south-west of Carrachan Dubh.

8.9.5 The three off-site areas (Units A - C) have been identified as comprising predominantly 'Raised and blanket bog; and Temperate Shrub heathland' type habitat, that have the potential for recovery and would respond to a programme of damming and a reduction in deer grazing pressure. The exact areas will need to be agreed with the land owner/land

[11] https://www.space-intelligence.com/scotland-landcover/

manager, contractors and in discussion with NatureScot prior to any management work commencing.

8.9.6 The implementation of restoration proposals within these candidate areas would also result in downstream benefits resulting from decreased erosion and runoff into the on-site watercourses and subsequently the River Cassley, part of the River Oykel SAC.

Deer Management Plan

8.9.7 A Deer Management Plan (DMP) has been prepared and is provided in Technical Appendix 8.9. The management plan provides detailed measures on the management of deer numbers to help minimise potential trampling and grazing damage to blanket bog habitat identified for habitat management proposals off-site (as detailed in the oHMP - Technical Appendix 8.10). This management plan has been prepared with consideration of the existing East Sub-Group Deer Management Plan (ESG DMP). The DMP also includes habitat condition monitoring which would result in amendments to the DMP as necessary.

8.10 Residual Effects

8.10.1 This chapter has considered the potential effects on the ecological features present at the site associated with the construction, operation and decommissioning of the Proposed Development. The residual effects assessed here are those effects remaining after all of the embedded mitigation (project assumptions) (Table 8.11) and additional mitigation measures (Section 8.9) have been taken into account.

8.10.2 Table 8.17 below summarises the significance of effect for each IEF and the residual significance.

Table 8.17: Summary of Residual Effects

Important Ecological Feature	Predicted Effect	Significance	Mitigation	Significance of Residual Effect
Construction and Decommissioning				
River Oykel SAC Atlantic salmon and freshwater pearl mussel	Indirect effects due to effects on host fish species (salmonids); and degradation of habitats due to pollution/siltation.	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
Caithness & Sutherland Peatlands SAC (Blanket bog and wet heath) **Caithness & Sutherland Peatlands Ramsar** (Blanket bog) **Grudie Peatlands SSSI** (Blanket bog)	Indirect disturbance and changes to composition of plant communities resulting from hydrological change	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
	Indirect disturbance/ displacement of local deer population during construction works, and resultant impacts to blanket bog communities	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11. A Deer Management Plan (DMP) has been prepared and is provided in Technical Appendix 8.9. The management plan provides detailed measures on the management of deer numbers to help minimise damage of the blanket bog habitat both on and off-site from trampling and grazing.	Not significant
Blanket bog	Direct loss and temporary damage to terrestrial habitats	**Significant**	There is the potential for significant adverse impacts arising from construction works to blanket bog habitat. The implementation of the proposed habitat management proposals which are detailed in the oHMP (Technical Appendix 8.10), would compensate for the loss of blanket bog and would be likely to contribute a net positive balance to the blanket bog resource within and around the site. A Deer Management Plan (DMP) has been prepared and is provided in Technical Appendix 8.9. The management plan provides detailed measures on the management of deer numbers to help minimise	Not significant

Important Ecological Feature	Predicted Effect	Significance	Mitigation	Significance of Residual Effect
			damage of the blanket bog habitat both on and off-site from trampling and grazing.	
	Indirect disturbance and changes to composition of plant communities resulting from hydrological change	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
Otter	Habitat loss	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
	Disturbance and displacement	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
	Temporary severance to commuting routes	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
	Injury and direct mortality to individual otters	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
	Reduction in habitat quality as a result of pollution incidents	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
Water vole	Habitat loss	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
	Injury and direct mortality	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
	Severance/ habitat fragmentation	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
	Reduction in habitat quality as a result of pollution incidents	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
Commuting and foraging bats: **All species**	Disturbance and/ or displacement of commuting and foraging bats	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
Commuting and foraging bats: **Common pipistrelle**		Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant

Important Ecological Feature	Predicted Effect	Significance	Mitigation	Significance of Residual Effect
Commuting and foraging bats: **Soprano pipistrelle**		Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
Operation				
Commuting and foraging bats: **All species**	Direct effect in the form of injury/ mortality from collision with turbines during the operational phase.	Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
Commuting and foraging bats: **Common pipistrelle**		Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant
Commuting and foraging bats: **Soprano pipistrelle**		Not significant	No further mitigation beyond embedded mitigation as detailed in Table 8.11.	Not significant

8.11 Cumulative Effects

8.11.1 Significant effects may not occur when considering the Proposed Development in isolation, but when potentially significant effects are considered in combination with nearby existing or proposed developments, significant cumulative effects may arise during each phase of the development. The context in which cumulative effects are considered depends upon the ecology of the species or habitat in question. The need to consider cumulative effects is a requirement of the EIA process, as specified by the EIA Regulations.

8.11.2 As outlined in Section 8.3, consideration has been given as to whether any of the IEFs taken forward for assessment in this chapter are likely to be subject to cumulative effects because of the effects generated by other developments.

8.11.3 With embedded mitigation measures (Table 8.11), any effects on habitats due to the Proposed Development are not anticipated to extend beyond the Site. However, the potential for cumulative effects needs to be considered in respect of designated sites, habitats and fauna identified as ecological features in this chapter, in particular aquatic ecology features (given the pathway via watercourses to off-site features) and highly mobile species such as otter.

8.11.4 This cumulative assessment comprises all developments within the spatial area within a 10km radius of the Proposed Development including wind farms (consented or in planning). In total, three wind farm developments are included in the assessment as listed in Table 8.18.

Table 8.18: Developments considered for Cumulative Assessment

Wind farm site	Approximate Distance from the Proposed Development (km)	Status	Number (and tip height) of Proposed Turbine	Important Ecological Features	Predicted Residual Impacts on Important Ecological Features (IEFs)
Braemore	5km	Consented	18 turbines 126m	Otter, Bats, Blanket bog (beneath clear fell)	During the construction phase of the development, no residual impacts were predicted that are significant at a local level or higher. During operation and decommissioning phases, no impacts were predicted for all IEFs.
Sallachy	9.5km	Scoping/ Screening	9 turbines 149.9m	Caithness and Sutherland Peatlands SAC (Otter, Blanket bog)	With the implementation of proposed mitigation measures, no likely significant residual adverse effects were predicted for any IEFs.
Meall Buidhe	9.5km	Application/ Appeal	9 turbines 149.5m	N/A	During construction, operation and decommissioning phases, no more than negligible effects were predicted for all IEFs.

Designated sites (notified for blanket bog interest) and blanket bog

8.11.5 The ecology chapter submitted as part of the Application for Braemore Wind Farm outlines that the land within the wind farm site comprised mainly of coniferous plantation, including clear-felled area (with modified blanket bog beneath). No significant residual impacts on blanket bog were predicted for Braemore Wind Farm at any phase of development. The ecology chapter submitted for the Sallachy Wind Farm details planned restoration work, within a proposed oHMP, which would involve restoring blanket bog in an area ca. 200Ha within the Study Area which is ca. ten times greater than the predicted habitat loss and a further 270Ha of peatland restoration within the Grudie Peatlands (SSSI and component part of the SAC and Ramsar site). The oHMP also identifies deer management as a key objective, reducing grazing pressure across the peatland habitats for a sustained period of time which will have benefits for the Caithness and Sutherland Peatlands SAC and Ramsar). The ecology chapter for Meall Buidhe identified the loss of approximately 4Ha of blanket bog habitat, however with the application of the oHMP and CEMP, residual effects on blanket bog were considered to be negligible.

8.11.6 Subject to the delivery of proposed habitat management/restoration proposals, the cumulative effect on Caithness and Sutherland Peatlands SAC/Ramsar/SSSI (all notified for their blanket bog interest) when considered in-combination with Sallachy Wind Farm is therefore considered to be negligible (with potentially net beneficial outcomes) and **not significant** at all phases of the development.

8.11.7 Similarly, subject to the delivery of proposed habitat management/restoration proposals, the cumulative effect on blanket bog habitats when considered in-combination with Braemore Wind Farm, Sallachy Wind Farm and Meall Buidhe Wind Farm is also considered to be negligible (with potentially net beneficial outcomes) and **not significant** at all phases of the development.

Otter

8.11.8 Of the protected species present within and adjacent to the Proposed Development, only otter is likely to experience any connectivity between the four sites, given that otters are highly mobile and can readily commute over 9.5km (the separation distance between the furthest of the three sites). Given the separation distance between each wind farm and the SAC, and the fact that the construction phase of the Proposed Development would be unlikely to coincide with construction phases of the three wind farms, cumulative disturbance of individual otters associated with the Caithness & Sutherland Peatlands SAC would be **not significant** at all phases of the development.

Bats

8.11.9 Given the potential foraging and commuting range for bats; the Site lies within a potential ZoI of two local windfarms: Braemore and Sallachy. A review of the Meall Buidhe Ecology chapter identified no significant roosting features within the turbine envelope and no confirmed roost sites within the study area. Given the distance between the two turbine envelopes (>11km), no connectivity is considered likely.

8.11.10 Due to the open and exposed nature of the Proposed Development, and local habitats to the north and north-east of the Site, there is no obvious commuting connectivity between the Site and the proposed Sallachy Wind Farm. Similarly, Braemore Wind Farm is situated approximately 6km to the east of the Site, however there are no obvious corridors of

connectivity due to the presence of open habitats and existing wind farms at Achany and Rosehall and extensive conifer plantation.

8.11.11 Based on the Sallachy and Meall Buidhe Ecology chapters, provided embedded mitigation measures are implemented no likely significant effects were predicted for bats in relation to the construction and operation of the Proposed Development.

8.11.12 Therefore, due to lack of clear connectivity between these sites and the low magnitude of predicted non-significant effect, **no significant cumulative effects** are predicted at all phases of development.

8.12 Conclusion

8.12.1 The combined direct loss, potential indirect habitat modification and temporary loss of blanket bog within the footprint of the Proposed Development is considered to be **significant**. However, the oHMP (Technical Appendix 8.10) sets out criteria for identifying and delivering compensatory habitat management areas off-site, which would compensate for the area of blanket bog that would be permanently and temporarily lost due to the Proposed Development, which would reduce the residual effect of habitat loss to **not significant**.

8.12.2 These proposals, which have adopted a precautionary approach and applied good practice principles will deliver long-term benefits to peatland habitats, including the restoration of previously damaged habitat with the opportunity to recover favourable condition for both vegetation communities and wildlife species.

8.12.3 Following the application of proposed mitigation measures, as set out in the outline CEMP (including preparation of a PPP as part of the CSL that will be required) (Technical Appendix 3.1), to avoid pollution and the release of sediment entering watercourses connected to the River Oykel SAC, the construction, operation or decommissioning of the Proposed Development would not adversely affect the integrity of the River Oykel SAC.

8.12.4 Following the application of the proposed mitigation measures, such as a DMP and standard working methods and good practice measures during construction (including SPPs), effects to the Caithness and Sutherland Peatlands SAC, Grudie Peatlands SSSI, bats, otter and water vole as a result of the construction, operation or decommissioning of the Proposed Development are predicted to be **not significant**.

8.13 References

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