

# 7 Ecology

## Contents

Executive Summary	7-3
7.1 Introduction	7-3
7.2 Legislation, Policy and Guidelines	7-5
7.3 Consultation	7-6
7.4 Assessment Methods and Significance Criteria	7-10
7.5 Baseline Conditions	7-22
7.6 Potential Effects	7-35
7.7 Mitigation	7-74
7.8 Residual Effects	7-78
7.9 Cumulative Effects	7-78
7.10 Summary	7-78
7.11 References	7-84

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# 7. Ecology

## Executive Summary

Targeted baseline ecology surveys, following best practice guidance, were undertaken between 2018 and 2020.

This chapter is supported by the following documents:

- Technical Appendix 7.1: Natural Heritage Desk Study Report;
- Technical Appendix 7.2: Phase 1 Habitat, National Vegetation Classification (NVC), Groundwater Dependent Terrestrial Ecosystem (GWDTE) and Peatland Condition Assessment (PCA) Survey Report;
- Technical Appendix 7.3: Protected Terrestrial Mammal Survey Report;
- Technical Appendix 7.4: Bat Survey Report;
- Technical Appendix 7.5: Reptile Survey Report;
- Technical Appendix 7.6: Outline Habitat Management Plan (OHMP);
- Technical Appendix 7.7: Vegetation Survey of the Turbine Locations; and
- Technical Appendix 7.8: Freshwater Pearl Mussel Survey Report.

The Study Area was characterised by blanket bog habitat with a variety of other habitats also present. These included wet dwarf shrub heath, wet modified bog, acid grassland, marshy grassland and dry dwarf shrub heath.

There were occasional signs of badger, otter and water voles recorded within the Study Area. These included a single, occasionally used satellite badger sett. A low number of otter signs were recorded in riparian habitats, including spraints and a single couch. Water vole signs were notable in riparian habitat along the existing access track. They were also occasionally recorded in suitable habitat more widely across the Study Area.

There were low number of bats recorded in the open habitat across the Study Area, including common pipistrelle, soprano pipistrelle and Daubenton's bat.

There were low number of reptiles recorded across the Study Area including adder, slow worm and common lizard.

Potential impacts assessed were considered in two main ways: (i) those during construction and (ii) those during operation. Impacts on sensitive ecological receptors were avoided and minimised wherever possible and were incorporated (in-built) into the design process.

This assessment does not predict any likely significant ecological residual effects associated with the construction and operation of the Proposed Development.

Opportunities for ecological enhancement are described in the OHMP.

## 7.1 Introduction

- 7.1.1 This chapter considers the likely effects of the Proposed Development on ecological receptors at the Site and surrounding Study Area, during construction and operation, with decommissioning impacts having been scoped out (see further details under Section 7.4). This assessment is based upon comprehensive baseline data, comprising specifically targeted ecological field surveys of important

and legally protected ecological receptors identified during desk study and consultation feedback. It draws on pre-existing information, where appropriate, from other studies, survey data sources and Chartered Institute for Ecology and Environmental Management (CIEEM) best practice guidance.

- 7.1.2 Alba Ecology Ltd. led on all aspects of the ecological fieldwork and assessment in association with the Proposed Development. Alba Ecology is a Scottish-based multi-disciplinary ecological consultancy that has worked in the north of Scotland for many years. Alba's staff have led on, and contributed to, all aspects of Ecological Impact Assessment (EclA) on many large-scale wind farm development projects, including the management of Ecological Clerks of Work (ECoW) teams, principal ornithological/ecological surveyors and advisors on planning applications, expert witness at Public Local Inquiry and production of EIA Reports and Habitat Regulations Assessments and Habitat Management Plans.
- 7.1.3 The ecological surveyors who undertook the surveys for the Proposed Development are Dr Kate Massey, Dr Peter Cosgrove, Dr Dawn Anderson and Mr Donald Shields. The surveyors have extensive ecological field experience in Sutherland and across the north of Scotland and have attended regular training events led by experts, covering areas such as species identification, recording data concisely and accurately, navigation techniques and health and safety. Surveyors were trained to carry out surveying and mapping work in a systematic manner, following recognised standardised survey methods.
- 7.1.4 This chapter is supported by the following figures and technical appendices:
- Technical Appendix 7.1: Natural Heritage Desk Study Report;
  - Technical Appendix 7.2: Phase 1 Habitat, National Vegetation Classification (NVC), Groundwater Dependent Terrestrial Ecosystem (GWDTE) and Peatland Condition Assessment (PCA) Survey Report;
  - Technical Appendix 7.3: Protected Terrestrial Mammal Survey Report;
  - Technical Appendix 7.4: Bat Survey Report;
  - Technical Appendix 7.5: Reptile Survey Report;
  - Technical Appendix 7.6: Outline Habitat Management Plan (OHMP);
  - Technical Appendix 7.7: Vegetation Survey of the Turbine Locations;
  - Technical Appendix 7.8: Freshwater Pearl Mussel Survey; and
  - A series of 14 ecological figures.
- 7.1.5 This chapter should be read alongside other chapters within the EIA Report, particular Chapters 2 - 4, 8 and 12.
- 7.1.6 The assessment involved the following key stages:
- Reference to relevant legislation, policy and guidance.
  - Identification of likely zone of influence of the Proposed Development.
  - Identification of potentially important ecological receptors likely to be affected (baseline conditions) by the Proposed Development.
  - Evaluation of important ecological receptors and features likely to be affected by the Proposed Development.
  - Identification of likely impacts and magnitude of the Proposed Development works on important ecological receptors.

- Assessment of the likely significant effects of the Proposed Development, including any mitigation and enhancement measures and assessment of any likely residual significant effects.
- 7.1.7 The term ‘receptor’ is used throughout this EIA process and is defined as the element in the environment affected by a development (e.g. a species or habitat in the case of ecology). The term ‘impact’ is also used commonly throughout the EIA process and is defined as a change experienced by a receptor (this can be beneficial, neutral or adverse). The term ‘effect’, which is also used commonly throughout the EIA process is defined as the consequences for the receptor of an impact. The use of the word ‘effect’ rather than ‘impact’ at the end of species and designated site accounts is based on the wording of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (Scottish Government, 2017) (hereafter referred to as the ‘EIA Regulations’) which requires the determination of ‘likely significant effects’.
- 7.1.8 Whilst considering a range of potential outcomes that could arise from the Proposed Development, the assessment reports the effects that are considered likely to be significant on the basis of evidence, standard guidance and professional judgement. It is these likely significant effects that the Applicant is obliged to report, and that the decision maker is obliged to consider.

## 7.2 Legislation, Policy and Guidelines

- 7.2.1 Relevant national planning policy guidelines, international commitments, legislation and planning policies relevant to the protection, conservation and enhancement of ecological interests associated with the Proposed Development are outlined below. The approach used to assess the significance of likely effects of the Proposed Development upon ecological receptors is set in the context of:
- The Wildlife and Countryside Act 1981 (as amended);
  - European Commission (EC) (2011 and 2020). European Biodiversity Strategy;
  - EC Directive 1992/43/EEC on the conservation of natural habitats and of wild fauna and flora. Hereafter referred to as the ‘Habitats Directive’;
  - The Conservation (Natural Habitats) Regulations 1994. Hereafter referred to as the ‘Habitats Regulations’;
  - The Conservation of Habitats and Species Regulations 2010;
  - The Nature Conservation (Scotland) Act 2004 (as amended);
  - Scottish Government (2014). Scottish Planning Policy (SPP);
  - Scottish Government (2017). Planning Circular 1 2017: The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017;
  - Scottish Government (2013). The Scottish Biodiversity List (SBL);
  - Scottish Government 2020. The Environment Strategy for Scotland: vision and outcomes;
  - Biodiversity net gain: Good practice principles for development: A practical guide. (CIRIA, CIEEM and IEMA, 2019);
  - Biodiversity New Gain in Scotland, (CIEEM Scotland Policy Group, 2019);
  - Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, 3rd Edition (CIEEM, 2018; and 2019 update);
  - Land-use planning system Scottish Environment Protection Agency (SEPA) Guidance Note 4: Planning guidance on on-shore windfarm developments. LUPG-GU4 Version 9, (SEPA, 2017a);

- Land-use planning system SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. LUPG-GU31 Version 3 (SEPA, 2017b);
- Carbon and Peatland Map (2016);
- Strategic Plan for Biodiversity 2011-2020. Convention on Biological Diversity, 2010;
- The UK Biodiversity Action Plan (BAP) 2004;
- Highland Wide Local Development Plan. The Highland Council (THC);
- Sutherland Local Biodiversity Action Plan, (LBAP); and
- NatureScot (2020), Advising on carbon-rich soils, deep peat and priority peatland habitat in development management - Guidance.

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

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

## 7.3 Consultation

7.3.1 Details of the scoping process are discussed in Chapter 2. Table 7.1 summarises the ecological responses received from statutory and non-statutory consultees in relation to the Proposed Development.

**Table 7.1 – Consultation Responses.**

Consultee	Consultation Response	Applicant Action
SNH (25 <sup>th</sup> July 2017)	<p>Caithness and Sutherland Peatlands Special Area of Conservation (SAC).</p> <p>New survey work will be required to assess how SAC otters (<i>Lutra lutra</i>) might be affected by the revised proposal. There may be notable changes on how otters now use this site since it was originally surveyed about seven years ago. Impacts on SAC otters should be assessed against the Conservation Objectives for the site, see; <a href="https://gateway.snh.gov.uk/sitelink/documentview.jsp?p_pa_code=8218&amp;p_Doc_Type_ID=29">https://gateway.snh.gov.uk/sitelink/documentview.jsp?p_pa_code=8218&amp;p_Doc_Type_ID=29</a>. For further advice on otter surveys, see; <a href="http://www.snh.gov.uk/docs/A1959316.pdf">http://www.snh.gov.uk/docs/A1959316.pdf</a></p> <p>Ecological survey work involving SAC otter and other protected species will need to be carried out afresh for this revised proposal.</p>	<p>Protected terrestrial mammal walkover surveys, including specifically for otters, were conducted following standard methods.</p> <p>Details of the survey methodology and results are provided in Technical Appendix 7.3 and summarised in Sections 7.4 and 7.5.</p> <p>Impacts on SACs otters are assessed against the Conservation Objectives for the SAC (Section 7.6).</p>

Consultee	Consultation Response	Applicant Action
<p>Phone and email correspondence with David Patterson of then SNH, now NatureScot.</p> <p>(June and July 2020)</p>	<p>Discussion and email correspondence in relation to peatland habitats, peatland condition and habitat management plans with agreement in principle with the objectives of the OHMP. Including discussions about grazing pressure and peatland restoration techniques.</p>	<p>Baseline surveys of peatland habitats have been undertaken, including Phase 1 Habitat, NVC and PCA. Details are provided in Technical Appendix 7.2 and summarised in Sections 7.4 and 7.5.</p> <p>Impacts on peatland habitats are assessed in Section 7.6.</p> <p>Opportunities to mitigated impacts on peatland habitats were identified throughout the design process. This included avoidance and minimisation (Section 7.6 and 7.7). Peatland habitat restoration measures are extensive and detailed in Technical Appendix 7.6 and summarised in Section 7.7.</p> <p>A PMP and OHMP are provided (Technical Appendix 12.2 and 7.6).</p>
<p>THC Pre-Application Consultation Feedback (July 2020)</p>	<p>SNH peatland comments.</p> <p>The proposed development site includes areas of carbon rich soils, deep peat and priority peatland habitat, the importance of which has been identified in SPP. An assessment of the impact of this proposal on this resource should be made and the EIAR should contain details of any mitigation measures which have been incorporated to ensure the protection of the carbon rich soils, deep peat and priority peatland habitats. The assessment should consider and if necessary quantify any loss of this resource and any impacts on the functioning of the habitats associated with it.</p> <p>The Site includes areas identified as class 1 and 2 on the Carbon and Peatland 2016 map, available from <a href="http://map.environment.gov.scot/Soil_maps/?layer=10">http://map.environment.gov.scot/Soil_maps/?layer=10</a>.</p> <p>Class 1 and 2 areas are considered to be nationally important carbon-rich soils, deep peat and priority peatland habitat, potentially of high conservation value and restoration potential. These areas are afforded significant protection under Scottish Planning Policy (SPP).</p> <p>The EIA Report will need to address, in detail, how a wind farm can be constructed without compromising this national interest. Opportunities to mitigate impacts through siting, design and other measures should be fully considered. This may include options for significant habitat restoration to mitigate any loss and damage to this peatland interest.</p> <p>Peat Management Plan (PMP) and Habitat Management Plan (HMP)</p>	<p>Baseline surveys of peatland habitats have been undertaken, including Phase 1 Habitat, NVC and PCA. Details are provided in Technical Appendix 7.2 and summarised in Sections 7.4 and 7.5.</p> <p>The ecological importance of the peatland habitats was assessed following CIEEM EclA guidelines and considered the Carbon and Peatland Maps.</p> <p>Impacts on peatland habitats are assessed in Section 7.6.</p> <p>Opportunities to mitigate impacts on peatland habitats were identified throughout the design process. This included avoidance and minimisation within the evolution of the design layout (Section 7.6 and 7.7). Peatland habitat restoration measures are extensive and detailed in Technical Appendix 7.6 and summarised in Section 7.7.</p> <p>A PMP and OHMP are provided (Technical Appendix 12.2 and 7.6).</p> <p>The SPP test in relation to peatland habitats is not “no overall loss of peatland habitat”, but that “any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation” (SPP, 2014). No likely significant adverse effects are predicted for peatland habitats (Section 7.6). Substantial beneficial effects are predicted from the</p>

Consultee	Consultation Response	Applicant Action
	<p>SNH advise that a PMP is produced as part of the EIA Report. The plan should clearly demonstrate that any impacts on peatland habitats can be substantially overcome and that there will be no overall loss of peatland habitat or the services that peatland delivers.</p> <p>SNH also recommend that a HMP should be submitted as part of this application. In advance of the meeting, SNH received verbal confirmation that the developers will submit a HMP, which will include beneficial peatland restoration measures. SNH welcome this early commitment.</p>	<p>proposed peatland restoration (Section 7.7).</p>
	<p>SEPA peatland comment.</p> <p>SEPA would also expect to see peatland restoration proposals as part of the application and the submission should outline what works could be carried out on the Site and include an indicative plan showing the potential opportunities. The Presentation states that Objectives 2 and 3 of the Outline Habitat Management Plan refer to peatland restoration and SEPA would be happy to be provide further advice once the OHMP is drafted.</p>	<p>Opportunities to mitigated impacts on peatland habitats were identified throughout the design process. Peatland habitat restoration measures are extensive and are detailed in Technical Appendix 7.6 and summarised in Section 7.7. Objectives 1, 2 and 3 are all intended to provide substantive peatland restoration opportunities.</p>
	<p>Protected species.</p> <p>SNH's protected species standing advice can be found on our website via the following link: <a href="https://www.nature.scot/professional-advice/planning-and-development/advice-planners-and-developers/planning-and-development-protected-animals">https://www.nature.scot/professional-advice/planning-and-development/advice-planners-and-developers/planning-and-development-protected-animals</a>.</p> <p>Further information on methods etc. for protected species surveys can be found on our website at: <a href="http://www.snh.gov.uk/planning-and-development/advice-for-planners-and-developers/">http://www.snh.gov.uk/planning-and-development/advice-for-planners-and-developers/</a>.</p> <p>Impacts of the proposal on deer and the dispersal of deer onto the surrounding area should be assessed. Deer Management Plans advice can be found at: <a href="http://www.snh.gov.uk/land-and-sea/managing-wildlife/managing-deer/">http://www.snh.gov.uk/land-and-sea/managing-wildlife/managing-deer/</a>.</p>	<p>Protected terrestrial mammal surveys were conducted following standard methods. Details of the survey methodology and results are provided in Technical Appendix 7.3 and summarised in Sections 7.4 and 7.5.</p> <p>Deer management is discussed in Technical Appendix 7.6.</p>
	<p>Ground Water Dependant Terrestrial Ecosystems.</p> <p>GWDTE are protected under the Water Framework Directive and therefore the layout and design of the development must avoid impact on such areas.</p> <p>The following information must be included in the submission:</p> <p>a) A map demonstrating that all GWDTE are outwith a 100 m radius of all excavations shallower than 1 m and outwith 250 m of all excavations deeper than 1 m and proposed</p>	<p>Baseline habitat surveys, including an assessment of potential GWDTEs were completed.</p> <p>Details of the survey methodology and results are provided in Technical Appendix 7.2 and summarised in Sections 7.4 and 7.5.</p> <p>GWDTEs are considered further in Chapter 12.</p>

Consultee	Consultation Response	Applicant Action
	<p>groundwater water abstractions. If micro-siting is to be considered as a mitigation measure the distance of survey needs to be extended by the proposed maximum extent of micro-siting. The survey needs to extend beyond the site boundary where the distances require it.</p> <p>b) If the above minimum buffers cannot be achieved, a detailed site specific qualitative and/or quantitative risk assessment will be required. We are likely to seek conditions securing appropriate mitigation for all GWDTE affected.</p> <p>Please refer to Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems for further generic advice and the minimum information SEPA requires to be submitted.</p> <p>SEPA would welcome early consultation on the results of the NVC survey.</p>	<p>NVC survey results were shared with SEPA in July 2020.</p>
	<p>Caithness and Sutherland Peatlands SAC.</p> <p>The location of one particular turbine is very close indeed to the boundary of the Strath an Loin component site. Depending on the distance from the SAC, combined with any connection to the SAC habitat, this may require further assessment to gauge what risk of impact, if any, there might be.</p> <p>Survey work will be required to assess how SAC otters might be affected by the revised proposal. Impacts on SAC otters should be assessed against the Conservation Objectives for the site, see; <a href="https://apps.snh.gov.uk/sitelink-api/v1/sites/8218/documents/29">https://apps.snh.gov.uk/sitelink-api/v1/sites/8218/documents/29</a>. For further advice on otter surveys, see; <a href="https://www.nature.scot/species-planning-advice-otter">https://www.nature.scot/species-planning-advice-otter</a>.</p>	<p>Baseline habitat surveys were completed.</p> <p>Details of the survey methodology and results are provided in Technical Appendix 7.2 and summarised in Sections 7.4 and 7.5.</p> <p>Potential impacts on SACs habitats and connectivity of habitats are assessed in Section 7.6. Impacts on the SAC habitats are assessed against the Conservation Objectives for the SAC (Section 7.6). No construction or operational activity will take place within the SAC or SAC catchment.</p> <p>Protected terrestrial mammal walkover surveys were conducted.</p> <p>Details of the survey methodology and results are provided in Technical Appendix 7.3 and summarised in Sections 7.4 and 7.5.</p> <p>Potential impacts on SACs otters are assessed against the Conservation Objectives for the SAC (Section 7.6).</p>
<p>John Muir Trust (27<sup>th</sup> January 2021) Zoom meeting</p>	<p>John Muir Trust representatives expressed concern regarding peatlands and were interested in the habitat management plans.</p>	<p>Discussed the baseline survey work and OHMP.</p> <p>Baseline habitat surveys, including Phase 1 Habitat, NVC and a PCA were completed.</p> <p>Details of the survey methodology and results are provided in Technical Appendix 7.2 and summarised in Sections 7.4 and 7.5.</p>

Consultee	Consultation Response	Applicant Action
		<p>Potential impacts on peatlands are considered in Section 7.6.</p> <p>The habitat management plans are presented in Technical Appendix 7.6 and summarised in Section 7.7.</p>

## 7.4 Assessment Methods and Significance Criteria

### Study Area

- 7.4.1 The Site and Study Area is part of a Highland deer-shooting estate rising from 170 m above sea level to an elevation of up to 511 m but predominantly at about 350 m. It is characteristic open moorland dominated with heather (*Calluna vulgaris*) over peat that blankets most of the Site.
- 7.4.2 The following geographic definitions are used in this chapter and associated Technical Appendices (Figure 7.1; Table 7.2).

**Table 7.2– Site and Study Area Definitions.**

Term	Definition
The Site	This refers to all the land within the Proposed Development site boundary.
The Development Footprint	This refers to the footprint of the Proposed Development infrastructure within the Site. It includes the turbines and associated hard standings, the access tracks, a temporary construction compound, a substation compound and a borrow pit search area.
The Study Area	<p>The Study Area equates to all the land within the Proposed Development site boundary which was considered to have potential for development, plus an appropriate survey buffer (Figure 7.1). This buffer can be variable depending on the ecological receptor and is described in the relevant Technical Appendices.</p> <p>For habitats the Main Study Area equates to the Site, not including the existing access track, plus a ca. 250 m buffer. For protected terrestrial mammals the Main Study Area was the Site, not including the existing access track, plus a 500 m buffer.</p> <p>Additional habitat and protected terrestrial mammals surveys were conducted along the existing access track. This included the existing access track plus a ca. 100 m buffer. Where this area is being discussed specifically it is termed the Access Track Study Area.</p> <p>Where the Main Study Area and Access Track Study Area are considered together, it is referred to as the Study Area.</p>

- 7.4.3 The main elements of the Proposed Development which have the potential to impact on ecological receptors both during construction and operation are described in Chapter 4 and include:
- nine turbines, 149.9 m in height;
  - nine turbine foundations and hard standing areas;
  - a total of 7,011 m of new access track;
  - a total of 8,871 m of existing track to be upgraded;
  - a substation compound;

- a temporary construction compound; and
- a borrow pit search area.

7.4.4 These elements of the Proposed Development are contained within the Site and form the Development Footprint. The 'zone of influence' for a project is the area over which ecological receptors may be affected by biophysical changes as a result of the Proposed Development and associated activities (CIEEM, 2018; 2019). The zone of influence will vary for different ecological receptors depending on their sensitivity to, and the nature of, an environmental change. The zone of influence can extend beyond the Site and the Study Area, particularly in the context of hydrological connectivity and potential pollution events. However, the Study Area for each receptor is considered an appropriate zone of influence for the vast majority of ecological receptors.

### ***Survey Approach***

7.4.5 Through a combination of scoping, desk studies, CIEEM guidance, previous surveys undertaken and knowledge of the Site, key ecological surveys were identified to consider the potential impacts of the Proposed Development on ecology. These studies included:

- a natural heritage desk study;
- a Phase 1 Habitat survey;
- a NVC survey;
- a GWDTE survey;
- a PCA;
- a protected terrestrial mammal survey;
- a bat survey;
- a reptile survey; and
- a freshwater pearl mussel survey.

7.4.6 The ecological surveys included a desk study of historical information sources and a series of targeted field surveys of potentially important and/or legally protected ecological receptors. All the ecology field surveys were undertaken by experienced ecological surveyors using recognised survey methods, during suitable times of year and under suitable weather conditions for the habitats and species concerned. Any departures from standard guidance are explicitly stated and reasons for the departure are given.

7.4.7 Further details of ecological survey methodologies and results can be found in Technical Appendices 7.1 to 7.5.

### ***Issues Scoped Out***

7.4.8 Ecological impacts arising from the process of decommissioning have been scoped out of this assessment. An assessment of the ecological impacts of decommissioning the Proposed Development has not been undertaken as part of the EIA because: (i) the future baseline conditions (environmental and other developments) cannot be predicted accurately at this stage; (ii) the proposals for decommissioning are not known at this stage, and (iii) the best practice decommissioning guidance methods will likely change during the lifetime of the Proposed Development and so cannot be predicted at this stage. Nevertheless, the Applicant commits to an additional consultation one year in advance of the year of decommissioning and to implement best practice decommissioning methods at the time of decommissioning. General decommissioning plans are considered within Chapter 4.

- 7.4.9 The EIA Regulations require all “*likely significant effects*” (beneficial and adverse) to be considered. This is usually taken to mean site specific related effects, although this is not as straightforward as it first appears to be. For example, the benefits to ecological receptors within the Study Area stemming from the contribution made by the Proposed Development towards countering climate change through renewable energy generation cannot yet be quantified at a local scale. Nevertheless, it is clear that a wind farm of the size of the Proposed Development would make a beneficial contribution to meeting national CO<sub>2</sub> emission targets as well as reducing actual CO<sub>2</sub> emissions, helping to combat climate change, a significant threat to habitats and species globally. Uncertainties regarding climate change predictions mean that it is not possible at present to carry out a quantitative assessment of the beneficial impacts of wind farms to habitats and species. Therefore, these have been scoped out of further consideration within the EIA.
- 7.4.10 Baseline data for freshwater macro-invertebrates, fish habitats and fish populations are generally used for monitoring water quality and establishing baseline conditions. Detailed freshwater macro-invertebrates, fish habitats and fish population baseline surveys were conducted at Sallachy in 2011 as part of the survey work for the previously proposed twenty-two turbine development (Sallachy Wind Farm Environmental Statement, 2011, WKN AG). These included all watercourses within the Site and surrounding area plus some control locations. No rare or otherwise important ecological features were identified from these surveys. Based on the previous survey results, and the use of the surveys for water quality monitoring purposes, these receptors have been scoped out of further consideration within the EIA. However, pre-construction surveys will be undertaken for future updating baseline monitoring purposes.

### ***Desk Study***

- 7.4.11 The natural heritage desk study was conducted using the relevant sources of data including NatureScots’s SiteLink website, the local biodiversity records group (Highland Biological Recording Group), the National Biodiversity Network (NBN) Atlas and previous ecological surveys of the Site. All known records of important ecological receptors within a 2 km radius of the Site were identified. All designated sites with ecological qualifying features within a 10 km radius of the Site were identified.

### ***Field Surveys***

#### Phase 1 Habitat Survey

- 7.4.12 A Phase 1 Habitat survey of the Main Study Area was conducted in July 2019. A Phase 1 Habitat Survey of the Access Track Study Area was conducted in June 2020. A Phase 1 Habitat Survey was conducted at the entrance point to the to the access track just off the A838 in February 2021. The vegetation was described and mapped following the methods described in the Joint Nature Conservation Committee (JNCC) Handbook for Phase 1 Habitat surveys (JNCC, 2010; revised 2016). Details of the survey methodology and results are provided in Technical Appendix 7.2.

#### National Vegetation Classification (NVC) Survey

- 7.4.13 A NVC survey of the Main Study Area was conducted in July 2019. A NVC of the Access Track Study Area was conducted in June 2020. An NVC survey was conducted at the entrance point to the to the access track just off the A838 in February 2021. The vegetation was classified and mapped following the methods described in the JNCC National Vegetation Classification User’s Handbook (JNCC, 2006). Details of the survey methodology and results are provided in Technical Appendix 7.2.

#### GWDTE Survey

- 7.4.14 Wetland habitats were identified in July 2019, July 2020 and February 2021 as part of the Phase 1 Habitats and NVC vegetation surveys, in accordance with the Functional Wetland Typology. Where

wetlands were identified, an assessment was made as to whether they were likely to be potential GWDTes as defined by SEPA (SEPA, 2017a and SEPA, 2017b). Details of the survey methodology and results are provided in Technical Appendix 7.2.

#### Peatland Condition Assessment (PCA)

- 7.4.15 A PCA was undertaken in July 2019 and June 2020 as part of the Phase 1 Habitats and NVC vegetation surveys, in accordance with the Peatland Action Guidance (Peatland Action, 2016). Details of the assessment methodology and results are provided in Technical Appendix 7.2.

#### Protected Terrestrial Mammals Survey

- 7.4.16 Protected terrestrial mammal walkover surveys were conducted to assess the likelihood of the presence of wildcat (*Felis sylvestris*), pine marten (*Martes martes*), badger (*Meles meles*), otter and water vole (*Arvicola amphibius*) within the Study Area. The walkover surveys were undertaken during a prolonged period of suitable survey conditions (particularly required for otter and water vole surveys) and consisted of walkover surveys using standard methods. Protected terrestrial mammal walkover surveys of the Main Study Area were undertaken in 2018 and 2019. Protected terrestrial mammal walkover surveys of the Access Track Study Area were undertaken in 2020.
- 7.4.17 Infra-red trail cameras were used and placed strategically across likely mammal tracks and routes in potentially suitable habitat in an attempt to survey nocturnal/crepuscular and otherwise difficult to record protected terrestrial mammal species that may have been using the Study Area.
- 7.4.18 Details of the survey methodology and results are provided in Technical Appendix 7.3.

#### Bat Survey

- 7.4.19 Three survey methods were used to survey the bats within the Study Area:
- a habitat suitability assessment;
  - a potential bat roost survey; and
  - bat activity surveys.
- 7.4.20 These surveys followed best practice guidance (e.g. SNH *et al.*, 2019) and were conducted in the spring, summer and autumn months of 2019. Potential bat roost surveys were undertaken along the Access Track Study Area in June 2020. Details of the survey methodology and results are provided in Technical Appendix 7.4.

#### Reptile Survey

- 7.4.21 Reptile surveys followed the standard methodology as described by Froglife (1999) and the Herpetofauna Groups of Britain and Ireland (HGBI) (1998). This involves placing sheets of ca. 1 m<sup>2</sup> dark material in a sample of potentially suitable habitats in the Study Area for reptiles and checking them at regular intervals. Details of the survey methodology and results are provided in Technical Appendix 7.5.

#### Vegetation Assessment of Turbine Locations

- 7.4.22 The proposed turbine locations, along with the proposed hardstanding and turning circles and some of the track, were walked at the end of October 2020. The vegetation type at each proposed turbine location was assessed using quadrat and transect data. This vegetation assessment provides a more detailed, localised consideration of the vegetation at the proposed turbine locations. The turbine locations and adjacent areas were searched for bog pools, bog-moss hummocks, erosion features and any other features of note. Details of the assessment methodology and results are provided in Technical Appendix 7.7.

### Freshwater pearl mussel survey

- 7.4.23 The watercourses within the Main Study Area had previously been assessed for potential suitability by Alba Ecology (Cosgrove, 2011) on behalf of WKN, AG. The 2011 report concluded “*Many small watercourses are present in the proposed Sallachy wind farm site, none of which appears suitable and therefore capable of holding a population of freshwater pearl mussels. Therefore, there is no evidence that the proposed wind farm poses a significant threat to any freshwater pearl mussel populations*”. At the time, survey work along the planned access track was not commissioned and so the 2011 work focussed entirely on watercourses within the Main Study Area, all of which were assessed as unsuitable and so are dropped from further consideration within the current study. The potential suitability of the watercourses is highly unlikely to have altered since 2011. Furthermore, all known extant pearl mussel populations in Scotland have headwater lochs, none of the Study Area watercourses have headwater lochs.
- 7.4.24 The Access Track Study Area had not previously been assessed or surveyed and so this formed the basis of 2020 freshwater pearl mussel survey.
- 7.4.25 Two permanent watercourses within the Access Track Study Area were identified as holding potentially suitable habitats: Abhainn a’ Choire and the short, but wide unnamed watercourse between Loch a’ Ghriama and Loch Shin.
- 7.4.26 Abhainn a’ Choire and the short unnamed watercourse between Loch a’ Ghriama and Loch Shin were entered and searched for freshwater pearl mussels, where health and safety conditions allowed, using an amended version of the standardised methodology for site specific projects, as recommended by SNH (no date) in June 2020. Details of the assessment methodology and results are provided in Technical Appendix 7.8.

### ***Assessment of Potential Effects***

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

### Criteria for Evaluating Importance

- 7.4.28 The ecological receptors identified in the baseline studies were evaluated following best practice guidelines (e.g. CIEEM, 2018; 2019). Identifying the importance of potential ecological receptors was the first step of the evaluation process, and those considered important were then subject to detailed survey and assessment. Those considered sufficiently widespread, unthreatened and resilient to the potential project impacts were scoped out of further assessment as per best practice guidance (CIEEM, 2018; 2019).
- 7.4.29 Ecological receptors can be important for a variety of reasons and the rationale used to define their importance has been explained to demonstrate a robust selection and evaluation process. Importance may relate, for example, to the quality or extent of designated sites or habitats, to habitat/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline. Various characteristics contribute to the potential importance of ecological receptors within a study area. Examples include:
- naturalness;
  - animal or plant species, sub-species or varieties that are rare or uncommon, either internationally, nationally or more locally, including those that may be seasonally transient;

- ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages;
- endemic species or locally distinct sub-populations of a species;
- habitats that are rare or uncommon;
- habitats that are effectively irreplaceable;
- habitat diversity;
- size of habitat or species population;
- habitat connectivity and/or synergistic associations;
- habitats and species in decline;
- rich assemblages of plants and animals;
- large populations of species or concentrations of species considered uncommon or threatened in a wider context;
- plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species-poor communities; and
- species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

7.4.30 Guidance on EcIA (CIEEM, 2018; 2019) sets out categories of ecological or nature conservation importance that relate to a geographical framework (e.g. international through to local) together with criteria and examples of how to place a site (defined by its ecological attributes) into these categories. It is generally straightforward to evaluate sites or species populations designated for their international or national importance (as criteria for defining these exist e.g. SAC or Site of Special Scientific Interest (SSSI)), but for sites or populations of regional or local importance, criteria may not be easily defined. Where possible, the potential importance of an ecological receptor in the Study Area has been determined within a geographical context using categories outlined in Table 7.3.

**Table 7.3 – Summary of Geographical Importance of Species or Habitats.**

Importance term	Example	Context
International	For example;  >1 % of European Community (EC) population/resource of habitat that are the considered internationally important (e.g. listed on Annex 1 of the Habitats Directive); and/or  Species or habitats named as a designating feature within an international designated site, e.g. SAC, Ramsar.	European
National	For example;  >1 % of national (UK/Scotland) population/resource of habitat listed on the SBL;  Species or habitats named as a designating feature within a nationally designated site, e.g. SSSI;  Potentially, a species or high quality habitat linking two (or more) nationally designated sites, which are designated for that feature; and/or  Potentially, a habitat of particular high quality, which is rare and/or meets SSSI selection criteria.	UK/Scottish

Importance term	Example	Context
Regional	<p>For example;</p> <p>&gt;1 % of Regional (Highland) population/area of population/area of habitat;</p> <p>Potentially, a species or high quality habitat connected to a nationally important site, or forming a link with a nationally important site, that is designated for that feature; and/or</p> <p>Species or habitats, that are not within a designated site, but are particularly diverse or at the edge of their range.</p>	The Highlands
Local	<p>For example;</p> <p>Commonplace and widespread species and habitats, which, despite their ubiquity, contribute to the ecological function of the local area (habitat networks etc).</p>	In the vicinity of Loch Shin

7.4.31 It should be noted that there is no fundamental biological reason to take 1 % of a population as the threshold level for establishing the level of importance of a site. Nevertheless, this percentage is widely considered to be of value in developing measures that give an appropriate level of protection to populations and has gained acceptance on this basis throughout the world. The criterion was, for example, adopted by parties involved in the Ramsar Convention 1971. Thereafter, the 1 % level of national species totals has been taken as the basis of assessment in various countries, including Britain (Stroud *et al.*, 1990).

7.4.32 The ecological importance afforded to a habitat or species within a site or study area, is determined by both the geographical context, as well as the range of ecological characteristics of the habitat or species exhibit (listed above in paragraph 7.4.29). For example, a habitat in any condition within a study area, which is >1 % of the national total could be considered nationally important, whereas a habitat smaller than this, but considered to be of particular high quality (for example, meeting SSSI selection criteria) and/or are connected to and providing a potentially important stepping-stone between designated sites, may also be considered nationally important.

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

7.4.34 For the avoidance of doubt, CIEEM EclA guidance (2018) makes it clear that species which appear on national lists e.g. Schedule 1 of the Wildlife and Countryside Act (1981 as amended) or the SBL, are not necessarily evaluated as of national importance simply by appearing on such a list. Importance evaluation must consider the number of individuals of species within a geographical context/scale, i.e. how many of a particular species are likely to be affected by the Proposed Development and what proportion of the local/regional/national population does this constitute. Legal listing or protection is a separate but important consideration.

7.4.35 The importance evaluation of peatland habitats takes NatureScot's Carbon and Peatland Map (2016) into consideration. The Carbon and Peatland Map is "*a predictive tool which provides an indication of*

*the likely presence of peat on each individually mapped area, at a coarse scale. The types of peat shown on the map are: carbon-rich soils, deep peat and priority peatland habitat” (SNH, 2019).*

- 7.4.36 The Carbon and Peatland Map shows the areas of peat referred to in Table 1 in SPP carbon-rich soil, deep peat and priority peatland habitat. On the map, the top two classes (1 and 2) taken together identify the nationally important resource:
- Class 1: Nationally important carbon-rich soils, deep peat and priority peatland habitat; and Areas likely to be of high conservation value.
  - Class 2: Nationally important carbon-rich soils, deep peat and priority peatland habitat; and Areas of potentially high conservation value and restoration potential.
- 7.4.37 The Carbon and Peatland Map can only indicate that carbon-rich soils, deep peat and priority peatland habitat might be present. It is intended to be helpful in the initial site selection process undertaken by developers (SNH, 2019). SNH state that *“the map should not be used in development management decision-making. A detailed site survey and EIA will be required”*.
- 7.4.38 SNH guidance (2015) on spatial planning emphasises: *“The location of a proposal in the mapped area does not, in itself, mean that the proposal is unacceptable, or that carbon rich soils, deep peat and priority peatland habitat will be adversely affected. The quality of peatland tends to be highly variable across an application site and a detailed assessment is required to identify the actual effects of the proposal.”* The ecological importance evaluation of peatland habitat follows CIEEM EclA guidance and includes the consideration of NatureScot’s Carbon and Peatland Maps as well as the condition of the habitat, SBL, Annex 1 habitat description, the geographical extent and a range of ecological characteristics.
- 7.4.39 In summary, the importance evaluation of an ecological receptor takes into account a multitude of attributes and is carefully considered in a site/species/habitat specific manner.
- 7.4.40 Once the importance of an ecological receptor has been determined, the potential impacts on that receptor are considered in terms of magnitude, extent, duration, frequency and timing, reversibility, sensitivity and whether the predicted impacts would likely be beneficial, adverse or neutral.

#### Criteria for Evaluating Potential Impacts and Effects

- 7.4.41 An assessment of potential impacts from construction and operation of the project was conducted on each ecological receptor that was determined important. The assessment of impacts takes into account the baseline conditions and determines if the predicted impacts are likely to result in a significant biological effect.

#### *Beneficial or Adverse*

- 7.4.42 According to CIEEM EclA guidance (2018; 2019) beneficial (positive) and adverse (negative) impacts and effects should be determined according to whether the change is in accordance with nature conservation objectives and policy. In the CIEEM EclA guidance, the terms positive and negative are used, but in this EIA Report chapter the equivalent terms beneficial and adverse are used, as synonyms, for consistency between chapters. These terms are defined as:
- Beneficial – a change that improves the quality of the environment e.g. by increasing species diversity, extending habitat or improving water quality. This may also include halting or slowing an existing decline in the quality of the environment.
  - Adverse – a change which reduces the quality of the environment e.g. destruction of habitat, habitat fragmentation, pollution.
  - Impacts and effects can also be assessed as neutral.

#### *Extent*

- 7.4.43 According to CIEEM EclA guidance (2018; 2019) the extent is the spatial or geographical area over which the predicted impact/effect may occur under a suitably representative range of conditions.

#### *Magnitude*

- 7.4.44 According to CIEEM EclA guidance (2018; 2019), magnitude refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population. CIEEM guidance does not encourage the use of artificial magnitude criteria, but for consistency across other EIA Report chapters, in this assessment there are considered to be four levels of magnitude of impact (Table 7.4) and it is assumed these are adverse, unless otherwise stated. Consequently, in this chapter we provide magnitude metrics wherever possible in both absolute and/or relative terms and also refer to these magnitude criteria.

**Table 7.4 – Summary of Magnitude Criteria Used.**

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

#### *Duration*

- 7.4.45 According to CIEEM EclA guidance (2018; 2019), duration should be defined in relation to ecological characteristics (such as the life-cycle of a species). The duration of an activity may differ from the duration of the resulting effect caused by the activity. Impacts and effects may be described as short, medium or long-term and permanent or temporary and should be defined. In this assessment three broad time-frames are used: short term (up to two years), medium term (two-five years) and long term (between 5 years and the life time of the proposed wind farm).

#### *Frequency and Timing*

- 7.4.46 According to CIEEM EclA guidance (2018; 2019), the number of times an activity occurs will influence the resulting effect. For example, a single person walking a dog will have very limited impact on nearby otters using wetland habitat, but numerous dog walkers will subject the otters to frequent disturbance and could affect breeding success, leading to displacement and knock-on effects on their ability to survive. The timing of an activity or change may result in an impact if it coincides with critical life-stages or seasons.

#### *Reversibility*

- 7.4.47 According to CIEEM EclA guidance (2018; 2019), an irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be

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

*Sensitivity Criteria*

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

7.4.49 By way of example, sensitivity is determined according to species' behaviour, using broad criteria set out in Table 7.5. Behavioural sensitivity can differ between species and between individuals of the same species. Therefore, sensitivity is likely to vary with both the nature and context of the disturbance activity as well as the experience and even 'personality' of the species, in the case of mammals. Sensitivity also depends on the activity the species is undertaking and when it is doing it. For example, a species is likely to be less tolerant of disturbance during the breeding season than at other times of year. Thus, sensitivity changes with both space and time.

**Table 7.5 – Summary of Sensitivity Criteria Used.**

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

*Likelihood*

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

Criteria for Evaluating Significance

7.4.51 Significance is a concept related to the weight that should be attached to predicted effects when decisions are made. For the purposes of EclA a “*significant effect*” is an effect that either supports or undermines biodiversity conservation objectives for important ecological receptors (CIEEM, 2018; 2019). There could be any number of possible impacts on important ecological features arising from a development. However, it is only necessary to describe in detail the impacts that are *likely* to be significant. Impacts that are either unlikely to occur, or if they did occur are unlikely to be significant, can be scoped out.

7.4.52 In the context of the EIA Regulations, each likely effect is evaluated and classified as either significant or not significant, using professional judgement, evidence and best practice guidance. In this assessment, an ecologically significant effect is defined as an “*impact on the structure and function of*

*a defined site, habitat or ecosystem and the conservation status of habitats and species (including extent, abundance and distribution). Significant effects should be qualified with reference to an appropriate geographical scale". Thus, the geographical terms of reference at which a predicted effect may be considered significant must also be defined (e.g. an effect on a species population or habitat area evaluated to be of regional importance at a given site is likely to be either significant or not at the regional level). Effects can be considered significant at a wide range of scales from international to local.*

- 7.4.53 There is often confusion over geographical context, potentially important receptors and quantifying predicted effects and EclA best practice guidance has often struggled to articulate this clearly. For example, if a potentially important species appears on a conservation list e.g. the SBL and there is a predicted impact, the geographical context in which the receptor is found must be considered. Therefore, the simple presence of a species on the SBL within a proposed development area does not mean that likely effects are significant at the national (Scottish) level. For that to occur, the proposed development must have significant effects on its national population (CIEEM, 2018; 2019).

### ***Requirements for Mitigation***

- 7.4.54 Best practice guidance e.g. CIEEM (2018; 2019) identifies a hierarchy of mitigation for potential impacts that seeks to:
- avoid adverse ecological impacts, especially those that could be significant to important receptors;
  - minimise adverse impacts that could not be avoided; and
  - compensate for any remaining significant residual impacts.
- 7.4.55 CIEEM (2018; 2019) states that *"Avoiding and/or minimising negative impacts is best achieved through consideration of potential impacts of a project from the earliest stages of scheme design and throughout its development"*. This approach, to avoiding potential adverse impacts within a design layout, is sometimes described as embedded mitigation or mitigation by design. *"Mitigation by design is particularly beneficial as there is greater certainty that it will be delivered"* (CIEEM, 2018; 2019).
- 7.4.56 The embedded mitigation is considered in the design layout and will be included in planning conditions for the Proposed Development. Where likely significant adverse effects are predicted regardless of design layout, further mitigation is separately identified as per CIEEM guidance.
- 7.4.57 After assessing the potential impacts of the Proposed Development (incorporating embedded mitigation), all attempts were made to further avoid and mitigate predicted adverse ecological impacts. Once measures to avoid and mitigate predicted ecological impacts had been incorporated, assessment of the residual impacts was undertaken to determine the likely significance of their effects on important ecological features.
- 7.4.58 There are three key mitigation hierarchy principles of EclA (CIEEM, 2018; 2019), namely avoidance first, followed by minimisation and finally by compensation, along with enhancement. These have all been considered and/or used through the design process of the Proposed Development.

### **Avoidance**

- 7.4.59 According to CIEEM EclA best practice guidance (2018; 2019), adverse effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed. For example, through a planning condition. The baseline habitat surveys influenced the project design, avoiding wherever possible areas of higher ecological sensitivities.

### Minimisation

- 7.4.60 According to CIEEM EclA best practice guidance (2018; 2019), where design layout impacts on important ecological receptors cannot be avoided, they should be minimised. Minimisation takes many forms, with subsequent design iteration being tweaked and amended where possible to reduce potential ecological impacts.

### Compensation

- 7.4.61 Where there are significant residual adverse ecological effects despite the mitigation proposed, these should, under EclA guidelines (CIEEM, 2018; 2019), be offset by appropriate compensatory measures.

### Enhancement

- 7.4.62 There is a growing body of policy and guidance that development plans should not just try to avoid causing likely significant effects. Best practice EclA guidance recommends seeking to provide net benefits for important biodiversity over and above design requirements for avoidance, minimisation or compensation (e.g. CIEEM, 2018; 2019).

### ***Assessment of Cumulative Effects***

- 7.4.63 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects are particularly important in EclA as ecological features may be already exposed to background levels of threat or pressure and may be close to critical thresholds where further impact could cause further or irreversible decline. Cumulative effects can also make habitats and species more vulnerable or sensitive to change (CIEEM, 2018; 2019).
- 7.4.64 There is no published NatureScot guidance for cumulative impact assessment on most ecological receptors. NatureScot's guidance on cumulative impact assessment of onshore wind farms is confined to landscape and birds. The key principle of NatureScot's cumulative impact assessment guidance for birds is to focus on any significant effects and in particular those that are likely to influence the outcome of the consenting process. Therefore, cumulative ecological impact would be considered on any impacts with likely significant effects.

### ***Limitations to Assessment***

- 7.4.65 Where assumptions within the assessment are made, these are explicitly identified and explained. Similarly, limitations in methods and knowledge of species' ecology are also identified and discussed, particularly where this is likely to affect the outcome of the assessment. As with any environmental assessment there will be elements of uncertainty. Where there is uncertainty, this is identified and reported transparently, along with the measures taken to reduce it, assumptions made, and an explanation as to the likely extent that any uncertainties are likely to affect the conclusions. In circumstances where there is uncertainty; evidence, expert opinion, best practice guidance and professional judgement have been used to evaluate what is biologically likely to occur if the Proposed Development is constructed.
- 7.4.66 The level of certainty of impact prediction varies depending upon a range of parameters discussed already. For some elements e.g. land-take it is relatively straightforward to assess and quantify the area of habitat that is likely to be lost to development infrastructure and therefore quantify potential impacts of land-take on the habitats present. However, other impacts are less certain because there can be a range of possible scenarios. The main limitations in this assessment are common to most ecological assessments because:

- Baseline surveys undertaken are based on sampling techniques, not absolute censuses. Results give an indication of the numbers of ecological receptors recorded at the particular times that surveys were carried out e.g. summer 2019. Species occurrence changes over time and therefore the results presented in this EIA Report are snapshots in time. Importantly, no information gaps were identified in the baseline survey data that would prevent assessments in line with the requirements of the EIA Regulations to be undertaken.
- Putting ecology survey results into a wider geographical context is sometimes challenging because most species and habitats have not been systematically surveyed beyond the Study Area. Thus, defining a receptor population as locally or regionally important is potentially difficult because local or regional population estimates do not exist for most taxa and habitats. Whenever such uncertainty exists, professional judgement and published evidence is used and populations in the Study Area or site have been assumed to be at their highest potential level of geographical/ecological importance.

## 7.5 Baseline Conditions

### *Desk Study - Designated sites*

7.5.1 A total of ten designated sites with ecological qualifying features within a 10 km radius of the Site were identified in the desk study (Figure 7.2; Table 7.6). The closest and most relevant to the Site was the Strath an Loin SSSI, which is also part of the Caithness and Sutherland Peatlands SAC and Ramsar site. All designated sites with birds as their only qualifying feature are not considered here but in Chapter 8.

**Table 7.6– Designated Sites within a 10 km Radius of the Site.**

Name	Designation	Size (ha)	Distance (km) and Direction from the Site	Feature of Interest
Ben Klibreck	SSSI	8,732 ha	9.9 km Northeast	Alpine heath Blanket bog Oligotrophic loch Upland birch woodland
Ben More Assynt	SSSI	8,836 ha	4.5 km west	Caledonia igneous caves Eutrophic lochs Oligotrophic rivers and streams Upland assemblages
Caithness and Sutherland Peatlands	SAC	143,561 ha	Adjacent 0.0 km south and south-east	Blanket bog Depressions on peat substrate Otter Acid, peat-stained lakes and ponds Wet heathland with cross-leaved heath ( <i>Erica tetralix</i> ) Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels Marsh saxifrage ( <i>Saxifrage hirculus</i> )

Name	Designation	Size (ha)	Distance (km) and Direction from the Site	Feature of Interest
				Very wet mires often identified by an unstable 'quaking' surface
Caithness and Sutherland Peatlands	Ramsar site	143,503 ha	Adjacent 0.0 km south and south-east	Blanket bog
Cnoc an Alaskie	SSSI	3,665 ha	7.3 km north-east	Blanket bog
Grudie Peatlands	SSSI	4,785 ha	4.9 km south-east	Blanket bog
Inchnadamph	SAC	1,283 ha	9.6 km west	Base-rich fens Alpine and subalpine calcareous Grasslands Base-rich scree Plants in crevices on base-rich rocks Dry heaths Limestone pavements Hard-water springs depositing lime Mountain willow scrub
River Oykel	SAC	921 ha	1.6 km south-west	Atlantic salmon ( <i>Salmo salar</i> ) Freshwater pearl mussel ( <i>Margaritifera margaritifera</i> )
Strath an Loin	SSSI	2,344 ha	Adjacent 0.0 km south and south-east	Blanket bog
Strath Duchally	SSSI	1,616 ha	4.0 km north-east	Blanket bog

### **Desk Study – Species and Habitats**

7.5.2 Further details of the of the desk study are provided in Technical Appendix 7.1, which make reference to the previous Sallachy Wind Farm Environmental Statement (WKN AG, 2011) and Technical Appendices. The desk study demonstrated that there are a large number of records of species of potential interest within vicinity of the Site, including legally protected, SBL and locally important species. Table 7.7 summaries the results of the desk study for species with potential ecological importance for the Study Area.

**Table 7.7– A Summary of Species Identified in the Desk Study with Potential Ecological Importance within the Study Area.**

Common Name	Species Name	Designation/Listing	Source
Large heath	<i>Coenonympha tullia</i>	SBL and LBAP	HBRG and previous surveys

Common Name	Species Name	Designation/Listing	Source
Pine marten	<i>Martes martes</i>	SBL and LBAP	HBRG
Juniper	<i>Juniperus communis</i>	SBL	NBN Atlas
Otter	<i>Lutra lutra</i>	European Protected Species (EPS) and SBL	NBN Atlas, SSSI citation and previous surveys
Rusty bog-moss	<i>Sphagnum fuscum</i>	LBAP	NBN Atlas
Marsh saxifrage	<i>Saxifrage hirculus</i>	SBL	SSSI citation
Alpine bearberry	<i>Arctostaphylos alpinus</i>	SBL and LBAP	SSSI citation and previous surveys
Dwarf birch	<i>Betula nana</i>	LBAP	SSSI citation and previous surveys
Bog orchid	<i>Hammarbya paludosa</i>		SSSI citation
Badger	<i>Meles meles</i>	EPS	Previous surveys
Water vole	<i>Arvicola amphibius</i>	EPS	Previous surveys
Common lizard	<i>Lacerta vivipara</i>	SBL	Previous surveys
Argent and sable	<i>Rheumaptera hastata</i>	SBL	Previous surveys
Azure hawk	<i>Aeshna caerulea</i>	Nationally scarce	Previous surveys

7.5.3 There were detailed records of the habitats in and around the Site from previous surveys from the previously proposed twenty-two turbine development, from NatureScot data and from the adjacent SSSI citation. The main semi-natural habitat within the Site was identified as blanket bog.

### **Habitat Surveys**

7.5.4 Further details of the methods and results of the Phase 1 Habitat and NVC surveys can be found in Technical Appendix 7.2 and Figures 7.3 - 7.6. The results are summarised here.

7.5.5 The Main Study Area was primarily blanket bog (NVC communities M17b, M19 and M20) comprising of heather, deergrass (*Trichophorum germanicum*), cottongrasses (*Eriophorum* spp.) and usually a combination of woolly fringe-moss (*Racomitrium lanuginosum*), lichens (*Cladonia* spp.) and bog-mosses (*Sphagnum* spp.). A large portion of the Main Study Area was mapped as blanket bog/wet heath transition (NVC communities M17/M15), as discrimination between wet heath and blanket bog by vegetation was not possible as it was between the two types.

7.5.6 Within the Main Study Area there was evidence of widespread erosion with large and small erosion gullies and hagg systems present. Grazing pressure was also evident on the blanket bog habitat with patches of bare peat and trampling. The bog comprised of a mixture of highly eroded wet modified bog (NVC communities M3), and areas of more complete, less eroded blanket bog habitat. Wet modified bog, dominated by purple moor-grass (*Molinia caerulea*; NVC communities M25) ran down slope, towards Loch Shin.

7.5.7 Wet dwarf shrub heath (NVC communities M15) was common along the ridge line from Maovally to Cnoc à Bhaid Bhàin. There were also areas of acid grassland (NVC communities U5, U6), marshy grassland (NVC communities M23) and dry dwarf shrub heath (NVC communities H10, H22). There was a small area of semi-natural broadleaved woodland in the north of the Main Study Area (NVC communities W4). There were some mosaics of habitat types, particularly along the stream sides. Table 7.8 displays the full list of Phase 1 Habitats mapped and the total estimated area of each habitat type found within the Main Study Area.

**Table 7.8– The Phase 1 Habitats in the Main Study Area.**

<b>Phase 1 Habitat</b>	<b>Area (ha)</b>	<b>% of Main Study Area</b>
Blanket bog	703.5	52.9
Blanket bog/wet heath transition	377.4	28.4
Wet modified bog	138.6	10.4
Wet dwarf shrub heath	75.6	5.7
Stream side of dry heath: acid flush: acid grassland	8.7	0.7
Road	4.1	0.3
Semi-natural broadleaved woodland	4.1	0.3
Dry dwarf shrub heath	3.6	0.3
Stream side of wet modified bog: bracken: acid grassland: dry heath: acid flush	2.5	0.2
Unimproved acid grassland	2.4	0.2
Wet modified bog: blanket bog	1.9	0.1
Acid flush	1.9	0.1
Stream side of dry heath: bracken: acid flush: acid grassland	1.5	0.1
Stream side of wet heath: acid flush: wet modified bog	1.3	0.1
Acid flush: wet modified bog	1	0.1
Blanket bog: dry heath	0.6	<0.1
Building	0.4	<0.1
Bracken	0.3	<0.1
Spoil	0.03	<0.1
Unimproved calcareous grassland	0.02	<0.1
<i>Total</i>	<i>1,329.5</i>	<i>100</i>

- 7.5.8 The Access Track Study Area was predominantly made up of wet dwarf shrub heath (NVC community M15) with many ribbons of marshy grassland and streams running towards Loch Shin (NVC community M25). There were small areas of blanket bog and blanket bog/wet heath transitional habitat (NVC community M17/M15) towards the top of the access track, adjacent to the Main Study Area, but this quickly gave way to the wet dwarf shrub heath habitat.
- 7.5.9 There were a variety of other vegetation types along the Access Track Study Area, usually as small patches, notably semi-natural woodland (NVC community W4), plantation and scrub. Table 7.9 displays the full list of Phase 1 Habitats mapped and the total estimated area of each habitat type found within the Access Track Study Area.
- 7.5.10 The previous Sallachy Wind Farm Environmental Statement (2011, WKN AG) and associated Technical Appendices reported a similar arrangement of habitats and communities within the Study Area.

**Table 7.9– The Phase 1 Habitats Described in the Access Track Study Area.**

Phase 1 Habitat	Area (ha)	% of Access Track Study Area
Wet dwarf shrub heath	91.1	55.8
Marshy grassland	30.0	18.3
Buildings and road	11.9	7.3
Blanket bog	6.7	4.1
Marshy grassland: acid flush	5.3	3.2
Stream side matrix	4.5	2.7
Blanket bog/wet heath transitional habitat	4.0	2.5
Coniferous plantation	3.1	1.9
Road and scrub	0.9	0.6
Semi-natural broadleaved woodland	0.9	0.5
Bracken	0.8	0.5
Inundation vegetation	0.7	0.4
Running water	0.7	0.4
Acid flush	0.6	0.4
Open water	0.6	0.4
Marshy grassland: acid grassland	0.4	0.2
Acid grassland	0.4	0.2
Dry dwarf shrub heath	0.3	0.2
Bracken, marshy grassland and acid grassland	0.2	0.1
Neutral grassland	0.1	0.1

Phase 1 Habitat	Area (ha)	% of Access Track Study Area
Dry stone wall	<0.1	<0.1
<i>Total</i>	<i>163.3</i>	<i>100</i>

7.5.11 Phase 1 Habitat and NVC was conducted at the entrance point to the access track just off the A838 in February 2021. The Entrance Point Study Area was a complex of vegetation reflecting the character of the wider area, with wet dwarf shrub heaths and marshy grassland habitats, but also reflecting local disturbances from e.g. roads, buildings and garden.

### **GWDTE**

7.5.12 Further details of the GWDTE survey and assessment can be found in Technical Appendix 7.2 and Figures 7.7 and 7.8. NVC communities recorded in the Study Area that are considered in the guidance (SEPA, 2017a; SEPA, 2017b) to be potentially groundwater dependent include:

- M6 *Carex echinata* – *Sphagnum fallax* mire;
- M10 *Carex dioica* – *Pinguicula vulgaris* mire;
- M15 *Trichophorum germanicum* – *Erica tetralix* wet dwarf-shrub heath;
- M23 *Juncus effusus/acuteiflorus* – *Galium palustre* rush-pasture;
- M25 *Molinia caerulea* – *Potentilla erecta* mire;
- U6 *Juncus squarrosus* – *Festuca ovina* grassland;
- CG10 *Festuca ovina* – *Agrostis capillaris* – *Thymus polytrichus* grassland; and
- W4 *Betula pubescens* – *Molinia caerulea* woodland community.

7.5.13 Of these, M6, M10, M23 and W4 are considered to be potentially highly groundwater dependent, depending on the hydrological setting (SEPA, 2017a; SEPA, 2017b). The M15, M25 and U6 communities are considered potentially moderately groundwater dependent, depending on the hydrological setting (SEPA, 2017a; SEPA, 2017b). The M17/M15 transitional habitat was considered to be part of the ombrotrophic peatland bog system.

7.5.14 Much of the potential GWDTE occurred as part of the ombrotrophic peatland bog system and their presence is considered to generally be related to the presence of waterlogged conditions sustained in the surrounding peatland bog system. As such, most of the communities were considered likely to be reliant on direct rainfall and limited drainage within the peatbog system, rather than groundwater, for their maintenance. GWDTEs are considered further in Chapter 12.

### **Peatland Condition**

7.5.15 Further details of the PCA can be found in Technical Appendix 7.2. All the blanket bog was considered to be modified through current and historic management practices, particularly from grazing. Some of the blanket bog (degraded areas of NVC communities M17b and M3) was also considered likely to be actively eroding and drained from erosion features (Figure 7.9). It should be noted there is some degree of subjectivity in the assessment tool, and so Figure 7.9 should be considered indicative.

- 7.5.16 The blanket bog in the Study Area was considered 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) (further details are provided in Technical Appendix 7.2).
- 7.5.17 The best areas of the blanket bog were considered, on the whole, to be the M19, particularly where the dwarf birch was located (Figure 7.10) and some of the M17b along the flattest part of the ridge towards Cnoc Glas na Crionaiche, where there were bog pools present. There were also some areas in which the M17b blanket bog was less damaged, particularly within the deer fenced areas and on some of the lower slopes.
- 7.5.18 The actively eroding blanket bog was generally considered to be a carbon store and source rather than a sink and unlikely to be active. It was considered that the blanket bog in the Study Area is likely to be largely inactive, but have areas that are partially active, most likely some of the wetter areas of M17b along the flattest part of the ridge towards Cnoc Glas na Crionaiche, where there were bog pools present.

### **Plants**

- 7.5.19 Further details of the plant species identified during habitat surveys are provided in Technical Appendix 7.2 (Figure 7.10). Three species of conservation interest were recorded:
- whortle-leaved willow (*Salix myrsinites*) which is on the SBL and an LBAP species;
  - alpine bearberry, which is an LBAP species; and
  - dwarf birch, which is an LBAP species.
- 7.5.20 The previous Sallachy Wind Farm Environmental Statement (2011, WKN AG) and associated Technical Appendices reported dwarf birch and alpine bearberry within the same habitat in the Study Area.

### **Protected Terrestrial Mammals**

- 7.5.21 Details of the protected terrestrial mammal surveys conducted in 2019 of the Main Study Area and in 2020 of the Access Track Study Area are provided in Technical Appendix 7.3, Figure 7.11 and 7.12 and are summarised here:
- There was no evidence of wildcat or pine marten recorded within the Main Study Area during either walkover surveys or camera trap surveys. However, a well-used pine martin latrine was identified just outside the Access Track Study Area near Site entrance.
  - A single, small but occasionally used satellite badger sett was recorded within the Main Study Area.
  - Otter spraints were recorded on Allt na Creiche and Allt na Crionaiche Bige, with an otter couch also recorded on Allt na Crionaiche Bige.
  - Water vole burrows were recorded in small numbers and low densities across the Main Study Area.
  - During summer of 2018, water vole signs, including burrows and latrines were recorded in areas away from main watercourse channels at NC 39959 21467. These were not present in the summer of 2019.
  - There were numerous water vole signs in marshy grassland adjacent to the access track from Abhainn a' Choire eastwards.
- 7.5.22 There was no evidence to suggest that the Study Area was regularly used by pine marten or wildcat, although this does not preclude their occasional use of the Study Area. There was some evidence of

otter and water vole use, the low amount of evidence recorded suggests that the Study Area was not particularly important for these mammals. However, there were defined areas within both the Main Study Area and Access Track Study Area clearly used by water voles and so these need careful consideration in relation to the planned works.

- 7.5.23 The badger sett recorded had periods where there were clear signs of occupation and period where it was abandoned. It was considered that this may be a satellite sett.
- 7.5.24 These results are broadly similar to those reported in the previous Sallachy Wind Farm Environmental Statement (WKN AG, 2011) and associated Technical Appendices. The previous protected terrestrial mammal survey results provided evidence for otter and badger using the Study Area, although water vole signs were not recorded in 2009 and 2010.

### **Bats**

- 7.5.25 Further details of the bat surveys are provided in Technical Appendix 7.4 and Figure 7.13. These surveys were conducted in 2019.
- A desk study was conducted of the Study Area to assess the suitability of the habitats present for bats. This assessment concluded that the Study Area had low bat habitat suitability.
  - A search for potential roost sites was conducted within the Study Area in 2019. One tunnel with bat roost potential was recorded. Emergence surveys were conducted in the spring, summer and autumn. No bats were recorded emerging during these surveys.
  - Searches for bat roost potential were conducted along the access track from the public road (A838) to the main Study Area in June 2020. Some bat roost potential was noted in two bridges along the existing access track, though no evidence of occupation was recorded.
  - Transects within the Study Area were walked during suitable weather in May, July and September 2019 using a hand-held bat detector. A single common pipistrelle (*Pipistrellus pipistrellus*) was recorded during the walkover transect surveys.
  - Bat activity surveys were conducted within the Study Area using static bat detectors (Anabat Express) across the spring, summer and autumn 2019. Static bat detectors were placed at 14 different representative locations between May and September 2019 (refer to Figure 7.13). These surveys recorded three bat species: common pipistrelle, soprano pipistrelle and Daubenton's bats.
  - A total of 60 nights of bat activity surveys were undertaken across the survey period (spring, summer and autumn, 2019). With all locations where static detectors were deployed taken into consideration, a total of 408 nights recording were made.
  - There was a total of 60 bat passes recorded throughout this survey period (408 nights). The majority of these were common pipistrelle, with a small number of Daubenton's and two soprano pipistrelle passes recorded.
- 7.5.26 Given the results from desk-study and bat activity surveys, there was evidence that the Study Area was used by very small numbers of primarily common pipistrelle, though some Daubenton's and soprano pipistrelle were also recorded.
- 7.5.27 The overall potential risk to bats of the Proposed Development was assessed, following standard guidance (SNH *et al.* 2019), as 'low' for all bat species recorded.
- 7.5.28 No evidence of bats were recorded in the previous Sallachy Wind Farm Environmental Statement (WKN AG, 2011) and associated Technical Appendices.

## **Reptiles**

- 7.5.29 Details of the reptile survey methodology and results are provided in Technical Appendix 7.5 and Figure 7.14. Dedicated surveys of for reptiles, using reptile refugia, provided records of common lizard (*Zootoca vivipara*) only. Incidental records of slow worm (*Anguis fragilis*) and adder (*Vipera berus*) were also recorded in the Study Area during other surveys.
- 7.5.30 Common lizards were recorded in the previous Sallachy Wind Farm Environmental Statement (2011, WKN AG) and associated Technical Appendices.

## **Freshwater Pearl Mussels**

- 7.5.31 Details of the freshwater pearl mussel survey methodology and results are provided in Technical Appendix 7.8. The Abhainn a' Choire and the short unnamed watercourse between Loch a' Ghriama and Loch Shin were surveyed for freshwater pearl mussels in June 2020 by a team of highly experienced, licensed surveyors (Licence No: 123301). Surveys were conducted during an extended period of suitable weather when the water levels were low and clear and the weather bright providing optimal surveying conditions.
- 7.5.32 No live or dead freshwater pearl mussels were recorded in either watercourse and no substantial areas of suitable in-stream habitats were present either. No reaches were too deep to survey.

## **Determining Importance**

- 7.5.33 Ecological features/receptors can be important for a variety of reasons and the rationale used in evaluation should be explained to demonstrate a robust and transparent selection process (CIEEM, 2018; 2019). Based on the results of the desk study, initial site-walkover, previous knowledge of the Site from the previously proposed twenty-two turbine development, field surveys, scoping comments and feedback from the regulators, legal protection and professional judgement, the following potentially important receptors were identified for further consideration:
- designated sites;
  - badger;
  - otter;
  - water vole;
  - bats;
  - three plant species (alpine bearberry, dwarf birch and whortle-leaved willow);
  - reptiles (common lizard, adder and slow worm); and
  - semi-natural habitats.
- 7.5.34 No other potentially important ecological receptors on which potentially significant effects were likely to occur were identified for further consideration. Other species (such as those identified in the desk study, cited as part of nearby designated areas with similar habitats to the Study Area or present in the Sutherland LBAP), were mainly scoped out of further consideration on the basis of:
- survey results from the previous proposed twenty-two turbine development;
  - recent survey results;
  - habitats within the Study Area (e.g. blanket bog) compared to the species' preferred habitat; and
  - the population size of the potentially important species on a geographical basis.

7.5.35 Table 7.9 summarises the evaluation of potentially important receptor population/feature within the Study Area.

**Table 7.9 – Summary Evaluation of Potentially Important Ecological Receptors.**

Potentially Important Receptor	Evaluation of Potentially Important Receptor Population/Feature within the Study Area
Designated sites	Internationally important designated sites within 2 km (e.g. Caithness and Sutherland Peatlands SAC and Ramsar site immediately adjacent to the Site and River Oykel SAC 1.6 km away). Nationally important designated sites present within 2 km (e.g. the Strath an Loin Site of SSSI immediately adjacent to the Site).
Badger	Badgers are a common and widespread legally protected species. A single sett (probably a satellite sett) was located within the Study Area with occasional occupancy. Badgers are considered to be of local importance within the Study Area and to have low sensitivity to human disturbance. <u>Status</u> : Least Concern in Scotland, GB population estimate 562,000 individuals (Mammal Society, 2018). Scottish population estimate 115,000 individuals (Mathews <i>et al.</i> , 2018).
Pine marten	Pine martens are a relatively common and widespread legally protected species with a regionally important population in Highland. No direct evidence of occurrence recorded within the Study Area, but considered likely to be occasionally present. Pine martens are considered to have moderate sensitivity to human activities/disturbance. <u>Status</u> : Least Concern in Scotland, GB and Scottish population estimate 1,600-8,900 individuals (Mammal Society, 2018; Mathews <i>et al.</i> , 2018). Scoped out of further consideration as no evidence of occurrence in Study Area although a well-used pine martin latrine was identified just off the Access Track Study Area near the site entrance. Watching brief recommendation for during construction phase.
Otter	Legally protected species with an internationally important population in adjacent the Caithness and Sutherland Peatlands SAC (it is a qualifying feature). Evidence of regularly occurrence within the Study Area, but no holts or breeding sites recorded during targeted surveys. Otters present in the Study Area are likely to be part of the SAC population and so are considered to be of international importance. Otters are considered to have moderate-high sensitivity to human activities, with resting places and holts considered highly sensitive. <u>Status</u> : Vulnerable in Scotland, GB population estimate unknown (Mammal Society, 2018).
Water vole	Legally protected species with nationally important population in Highland. Evidence of regularly occurrence but low population size within the Study Area. Due to the variable occupancy of the Study Area by water voles and the apparent low population size water voles are considered to be of local importance within the Study Area. Water voles are considered to be low sensitive to human disturbance. <u>Status</u> : Near-threatened in Scotland, GB population estimate 99,000-329,000 individuals (Mammal Society, 2018). Scottish population estimate ca. 50,000 individuals (Mathews <i>et al.</i> , 2018)
Wildcat	Legally protected species with nationally important populations in Highland. There was no evidence of wildcat occurrence within the Study Area. <u>Status</u> : Critically Endangered in Scotland, Scotland population estimate 30-430 individuals (Mammal Society, 2018). Scoped out of further consideration as no evidence of occurrence in Study Area, but note recommendation for watching brief during the construction phase.
Bats	Several legally protected species of bat are present in Sutherland. Three legally protected species of bat were recorded within the Study Area. No roost sites were recorded.  <u>Status</u> :

Potentially Important Receptor	Evaluation of Potentially Important Receptor Population/Feature within the Study Area
	<ul style="list-style-type: none"> <li>• Daubenton’s bat: Least Concern. UK estimated population of ca. 0.03-4.4 million (mean est. ca. 1 million) individuals (The Mammal Society, 2018). Scottish population estimate ca. 6,220-1.0 million (mean population est. ca. 0.2 million) individuals (Mathews <i>et al.</i>, 2018).</li> <li>• Common pipistrelle bat. Least Concern. UK estimated population of between ca. 0.9-7.5 million (mean population est. ca. 3 million) individuals (The Mammal Society, 2018). Scottish population estimate ca. 0.3-2.2 million (mean population est. ca. 0.9 million) individuals (Mathews <i>et al.</i>, 2018).</li> <li>• Soprano pipistrelle bat. Least Concern. UK population estimated population of between ca. 2-8.5 million (mean est. ca. 4.6 million) individuals (The Mammal Society, 2018). Scottish population estimate ca. 0.35-2.1 million (mean population est. ca. 1.2 million) individuals (Mathews <i>et al.</i>, 2018).</li> </ul> <p>Low levels of bat activity was recorded within the Study Area. Bat populations within the Study Area are considered to be of local importance. Bats are considered to have low sensitivity to human disturbance.</p>
Freshwater pearl mussel	<p>Legally protected species with internationally important population in the River Oykel SAC (it is a qualifying feature), which is 1.6 km away and in a different catchment. <u>Status</u>: Listed as Critically Endangered in Europe by IUCN. Scotland population declining; apparently extinct in 73 watercourses, not successfully recruiting in 44 watercourses and evidence of recent successful recruitment in 71 watercourses (Cosgrove <i>et al.</i>, 2016). In 2011, a habitat assessment was undertaken of all the watercourses within the Main Study Area to assess potential suitability for freshwater pearl mussels. The survey determined that <i>“Many small watercourses are present in the proposed Sallachy wind farm site, none of which appears suitable and therefore capable of holding a population of freshwater pearl mussels. Therefore, there is no evidence that the proposed wind farm poses a significant threat to any freshwater pearl mussel populations.”</i> The potential suitability of the watercourses is highly unlikely to have altered since 2011. Furthermore, all known extant pearl mussel populations in Scotland have headwater lochs, none of the Study Area watercourses have headwater lochs. In 2020 a survey was conducted for freshwater pearl mussel in the Abhainn a’ Choire and the short unnamed watercourse between Loch a’ Ghriama and Loch Shin within the Access Track Study Area. No live or dead freshwater pearl mussels were recorded in either watercourse and no substantial areas of suitable in-stream habitats were present either. Therefore, freshwater pearl mussels have been scoped out of further assessment.</p>
Semi-natural habitats	<p>Local, regionally, nationally and internationally important habitats present in Sutherland. Within the Study Area, the quantity/quality of semi-natural habitats evaluated as locally important, except for the blanket bog and bog pools which are evaluated as regionally important due to their proximity to designated sites with blanket bog as a qualifying feature<sup>1</sup>.</p>
GWDTE	<p>Potentially important GWDTE habitats present in the vicinity of the Study Area. All the potential GWDTE were assessed as not being actual GWDTE except for the M10 which was &gt;250 m from the Development Footprint (Chapter 12).</p>
Juniper	<p>Localised, but widespread across the UK (Streeter <i>et al.</i>, 2016; NBN Atlas, 2020). Declining population (Preston <i>et al.</i>, 2002). SBL species. A small number of juniper were recorded at NC 41961 19628. This was well away from the Development Footprint (&gt;400 m) and so has been scoped out of further assessment but recommend that the ECoW keeps a watching brief for this species during the construction phase.</p>

<sup>1</sup> Further details of the habitat importance evaluation can be found in Technical Appendix 7.2.

Potentially Important Receptor	Evaluation of Potentially Important Receptor Population/Feature within the Study Area
Rusty bog-moss	Nationally rare but distributed widely across northern UK (Atherton <i>et al.</i> , 2010). LBAP species. Rusty bog-moss was not recorded during field surveys. However, that does not preclude it from being present on site, especially as the habitat was suitable for this species and it is not conspicuous. It is considered possible to have some, probably limited, occurrence within the Study Area. Rusty bog-moss is considered to have moderate-high sensitivity to human activities/disturbance. Scoped out of further consideration as no evidence of occurrence in Study Area but recommend that the ECoW keeps a watching brief for this species during the construction phase.
Marsh saxifrage	Very rare and localised distribution across north of the UK (Streeter <i>et al.</i> , 2016; Preston <i>et al.</i> , 2002). SBL species. The IUCN reports marsh saxifrage as 'least concern' with a stable population (IUCN, 2020). Marsh saxifrage was not recorded during field surveys. However, that does not preclude it from being present, as some of the habitat within the Study Area may be suitable and it is an inconspicuous species when not flowering. Marsh saxifrage is considered to have moderate-high sensitivity to human activities/disturbance. Scoped out of further consideration as no evidence of occurrence in Study Area but recommend that the ECoW to keep a watching brief for this species during the construction phase.
Bog orchid	Uncommon. Distributed locally in the north of the UK (Preston <i>et al.</i> , 2002). It is not a SBL species, but is mentioned in the adjacent Strath an Loin SSSI citation. The IUCN reports bog orchid as 'least concern' with a stable population (IUCN, 2020). Bog orchid was not recorded during field surveys. However, that does not preclude it from being present on site, as some of the flushes within the Study Area may be suitable and it is an inconspicuous species (Preston <i>et al.</i> , 2002). It is considered possible that there is some, limited, occurrence within the Study Area. Bog orchid is considered to have moderate-high sensitivity to human activities/disturbance. Scoped out of further consideration as no evidence of occurrence in Study Area but recommend that the ECoW keeps a watching brief for this species during the construction phase.
Alpine bearberry	Localised occurrence in the uplands of north Scotland (Preston <i>et al.</i> , 2002). Nationally Scarce. LBAP species. Recorded in the Study Area, with many locations noted in Target Notes. The population in the Study Area is evaluated as locally important. Alpine bearberry is considered to have moderate sensitivity to human activities/disturbance.
Dwarf birch	Localised occurrence in the uplands of north Scotland (Preston <i>et al.</i> , 2002). Nationally rare. LBAP species. The IUCN reports dwarf birch as 'least concern' with a stable population (IUCN, 2020). Restricted distribution in the Study Area, found in a localised patch of M19 blanket bog. The population in the Study Area is evaluated as locally-regionally important. Dwarf birch is considered to have high sensitivity to human activities/disturbance.
Whortle-leaved willow	Very localised distribution restricted to the Scottish uplands (Streeter <i>et al.</i> , 2016; Preston <i>et al.</i> , 2002). SBL and LBAP species. It was recorded in several locations within the Study Area. The population in the Study Area is evaluated as locally-regionally important. Whortle-leaved willow is considered to have low sensitivity to human activities/disturbance.
Common lizard	Common and widespread in the UK. SBL species. They were recorded across the Study Area and are widespread and common across Scotland including in the uplands. Therefore, the population within the Study Area was considered to be of local importance. Common lizards are considered to have moderate sensitivity to human disturbance. <u>Status</u> : Least Concern in Scotland.
Adder	Adders are widespread in the UK (NBN Atlas, 2020). SBL species. A total of two adders were recorded during field surveys. Due to the widespread occurrence of this species across Scotland in a range of habitats, and the limited records in the Study Area, the

Potentially Important Receptor	Evaluation of Potentially Important Receptor Population/Feature within the Study Area
	adder population in the Study Area was considered to be of local importance. Adders are considered to have high sensitivity to human disturbance. <u>Status</u> : Least Concern in Scotland, GB population estimate to be declining (IUCN, 2020).
Slow worm	Slow worm is a common and widespread species in the UK (NBN Atlas, 2020). A single record of this species was noted during field surveys. Due to the widespread occurrence of this species across Scotland in a range of habitats, and the limited records in the Study Area, the slow worm population in the Study Area was considered to be of local importance. Slow worms are considered to have moderate sensitivity to human disturbance. <u>Status</u> : Least Concern in Scotland, GB population estimate to be stable (IUCN, 2020).
Large heath	<p>Widespread and common in the Scottish uplands and across Highland (Barbour <i>et al.</i>, 2008). Range declining (Asher <i>et al.</i>, 2001). SBL and LBAP species. Previous surveys demonstrated that it was common across the Study Area habitats. The population in the Study Area is considered locally important. It is considered to have low sensitivity to human disturbance.</p> <p>It is considered unlikely that this common and widespread species would be significantly adversely impacted though the Proposed Development because:</p> <ul style="list-style-type: none"> <li>• the Study Area is not specially designated for these species, or habitats which support these species;</li> <li>• no likely significant effects were predicted in the larger Sallachy Wind Farm Environmental Statement (2011, WKN AG); and</li> <li>• other than a potentially small (negligible) land-take of possible habitat, no significant impacts are considered likely from the Proposed Development on this species.</li> </ul> <p>Therefore, large heath has been scoped out of further assessment.</p>
Argent and sable	<p>Widespread and common in the Scottish uplands and across Highland (Hill <i>et al.</i>, 2010). SBL species. Previous surveys demonstrated that it was common across the Study Area. The population in the Study Area is considered locally important. It is considered to have low sensitivity to human disturbance.</p> <p>It is considered unlikely that this common and widespread species would be significantly adversely impacted though the Proposed Development because:</p> <ul style="list-style-type: none"> <li>• the Study Area is not specially designated for this species, or habitats which support this species;</li> <li>• no likely significant effects were predicted on this species in the Sallachy Wind Farm Environmental Statement (2011, WKN AG); and</li> <li>• other than a potentially small (negligible) land-take of possible habitat, no significant impacts are considered likely from the Proposed Development on this species.</li> </ul> <p>Therefore, argent and sable has been scoped out of further assessment.</p>
Azure hawk	<p>Classified as nationally vulnerable and scarce. It is not a SBL or LBAP species, but was given consideration in the Sallachy Wind Farm Environment Statement (2011, WKN AG). It is an uncommon species restricted to northern Scotland and Galloway (Cham <i>et al.</i>, 2014). However, recent evidence suggests it has been previously under-recorded (Cham <i>et al.</i>, 2014). Previous surveys demonstrated that it was present in the Study Area. The population in the Study Area is considered locally-regionally important, concentrated around bog pool habitats. It is considered to have moderate-high sensitivity to human disturbance.</p> <p>It is considered unlikely that this species would be significantly adversely impacted though the Proposed Development because the bog pool habitats where they are</p>

Potentially Important Receptor	Evaluation of Potentially Important Receptor Population/Feature within the Study Area
	<p>found were have largely been avoided by design. Furthermore, no likely significant effects were predicted in the larger Sallachy Wind Farm Environmental Statement (2011, WKN AG).</p> <p>Therefore, azure hawker has been scoped out of further assessment. The planned peatland restoration work, planned as part of the OHMP, would likely benefit this species.</p>

## 7.6 Potential Effects

### *Impacts to be Assessed*

- 7.6.1 The main construction and operational elements of the Proposed Development which have the potential to impact on ecological receptors both during construction and operation are assessed within this section. For further details of the Proposed Development refer to Chapter 4. A summary of the potential construction and operational impacts on ecology are outlined in Tables 7.10 and 7.11. Potential impacts in these tables do not imply that they would occur, or that any resultant effects would be significant.

**Table 7.10 – Summary of Potential Construction Impacts on Ecological Receptors.**

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

**Table 7.11 – Summary of Potential Operational Impacts on Ecological Receptors.**

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

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

### ***Effects on Designated Sites***

- 7.6.2 There are ten designated ecological sites within 10 km of the Proposed Development, as identified in Table 7.6. The closest and most relevant to the Site was the Strath an Loin SSSI, which is also part of the Caithness and Sutherland Peatlands SAC and Ramsar site and is designated for blanket bog.
- 7.6.3 No direct land-take will take place from the Strath an Loin (SSSI, and component part of the SAC and Ramsar) so no direct habitat loss of the designated site will occur. The closest turbine to Strath an Loin (SSSI, and component part of the SAC and Ramsar) is Turbine 3, located ca. 350 m from the boundary. Furthermore, the Strath an Loin is in a different water catchment to the Development Footprint, on the other side of an unnamed hill ridge. This is evidenced in the SSSI citation which states that the SSSI “*encompasses the entire catchment of the Allt Car which runs through Strath an Loin*”. Therefore, no adverse land-take impact on the blanket bog is predicted. The OHMP (Technical Appendix 7.6) 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 adjacent Strath an Loin (SSSI, and component part of the SAC and Ramsar). An additional objective of the OHMP is for peatland restoration within the Grudie peatlands (SSSI and component part of the SAC and Ramsar) which will also provide minor-moderate benefits to the SAC.
- 7.6.4 When assessing impacts on designated sites it is important to consider whether the Proposed Development, or the associated activities, are likely to undermine the conservation objectives of the site, the condition of the site, or the conservation status of the species or habitats for which the site is designated (CIEEM, 2018; 2019). Consideration should also be given to whether any process or key characteristic will be removed or changed, whether there will be an effect on the nature, extent, structure and function of component habitats and if there is an effect on the average population size and viability of species (CIEEM, 2018; 2019). The conservation status of these species is detailed in Table 7.12 (data from NatureScot Sitelink, January 2021).

**Table 7.12 Condition and Adverse Pressure on the Designated Features within the Strath an Loin SSSI, Caithness and Sutherland Peatland SAC and Ramsar (NatureScot Sitelink, 2021).**

Designated site	Designated feature	Latest assessed condition	Adverse pressures identified
Strath an Loin SSSI	Blanket bog	Favourable, maintained (August, 2004)	Trampling
Caithness and Sutherland Peatlands Ramsar	Blanket bog	Unfavourable, no change (June, 2017)	Burning Game/fisheries management Trampling
Caithness and Sutherland Peatlands SAC	Blanket bog	Unfavourable, no change (June, 2017)	Burning Game/fisheries management Invasive species Trampling
Caithness and Sutherland Peatlands SAC	Depressions on peat substrate	Unfavourable, no change (June, 2017)	Burning Game/fisheries management Trampling
Caithness and Sutherland Peatlands SAC	Otter	Unfavourable, declining (September, 2011)	Forestry operations Natural event
Caithness and Sutherland Peatlands SAC	Acid, peat-stained lakes and ponds	Favourable, maintained (August, 2004)	Forestry operations
Caithness and Sutherland Peatlands SAC	Wet heathland with cross-leaved heath ( <i>Erica tetralix</i> )	Unfavourable, no change (June, 2017)	Burning Game/fisheries management Trampling
Caithness and Sutherland Peatlands SAC	Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	Unfavourable, declining (August, 2015)	Forestry operations Water quality
Caithness and Sutherland Peatlands SAC	Marsh saxifrage	Favourable, maintained (August, 2007)	None
Caithness and Sutherland Peatlands SAC	Very wet mires often identified by an unstable 'quaking' surface	Favourable, declining (June, 2017)	None

- 7.6.5 The last site condition monitoring undertaken at Strath an Loin SSSI was apparently in 2004, 17 years ago. However, correspondence with NatureScot summarises the bog condition from a site-check visit in June 2014 (7 years ago) *“the condition of the blanket bog habitat appeared to be good. However, deer trampling was noted along the western slopes of the SSSI where the boundary adjoins Glencassley Estate... Future SCM assessment over a wider area of the bog will help determine if any changes to deer management in this general area are required”* (D. Patterson 2020 pers. comm.).
- 7.6.6 The conservation objectives for Strath an Loin SSSI (taken from Strath an Loin SSSI Site Management Statement, 2010) are:
- To maintain the condition and extent and distribution of peatland habitats.
  - To maintain water levels and water quality of dubh lochans.
  - To maintain breeding bird populations and to avoid significant disturbance of birds during the breeding season.
  - To maintain suitable otter habitat and access routes for otter across the site.
- 7.6.7 The conservation objectives for the Caithness and Peatlands (taken from Caithness and Peatlands SAC Conservation Objectives, no date) are:
- To avoid deterioration of the qualifying habitats (see Table 7.6) thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and
  - To ensure for the qualifying habitats that the following are maintained in the long term:
    - extent of the habitat on site;
    - distribution of the habitat within site;
    - structure and function of the habitat;
    - processes supporting the habitat;
    - distribution of typical species of the habitat;
    - viability of typical species as components of the habitat; and
    - no significant disturbance of typical species of the habitat.
  - To avoid deterioration of the habitats of the qualifying species (otter and marsh saxifrage) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and
  - To ensure for the qualifying species that the following are maintained in the long term:
    - Population of the species as a viable component of the site;
    - Distribution of the species within site;
    - Distribution and extent of habitats supporting the species;
    - Structure, function and supporting processes of habitats supporting the species; and
    - No significant disturbance of the species.
- 7.6.8 As there will be no land-take from Strath an Loin (SSSI, and component part of the SAC and Ramsar), given that Strath an Loin is in a different water catchment than the Proposed Development, there will be no direct loss to the blanket bog, or other qualifying habitats or from marsh saxifrage and these

features will not be directly impacted (Table 7.13). Therefore, no likely significant direct or indirect adverse effects are predicted for the designated sites.

- 7.6.9 Hydrological impacts and pollution pathways are considered in Chapter 12 which takes account of standard mitigation, in particular implementation of a suitable Construction Environmental Management Plan (CEMP) which will include measures for minimising disruption to groundwater flow and appropriate storage and management of fuels and chemicals. No likely impacts on ecological processes or the structure and function of the designated sites have been identified. Consequently, no likely significant indirect or direct effects are predicted for designated sites.
- 7.6.10 Otters within Strath an Loin (SSSI, and component part of the SAC and Ramsar) being mobile have the potential to be impacted by the Proposed Development, through for example, mortality, fragmentation, changes in population dynamics, changes to their food web and from pollution events. For further details see species specific assessment for otter (Section 7.6 Effects on Otter). In summary, the conditions required to support the population of otter is unlikely to be substantially impacted by the Proposed Development and the viability of the otter population is unlikely to be changed by the Proposed Development (Table 7.13).
- 7.6.11 There may be some noise disturbance from the construction and operation of the Proposed Development on otters in Strath an Loin (SSSI, and component part of the SAC and Ramsar). The construction work would extend over an 18 month period, but is in a different catchment, on the other side of the unnamed hill ridge to the designated site (and out of line of site). Disturbance to important otter locations within the designated site is therefore likely to be **negligible**. The magnitude of impact to otters as a consequence of potential disturbance from the construction and operation of the Proposed Development is assessed as **negligible**. The impact to otters within Strath an Loin (SSSI, and adjacent part of the SAC and Ramsar) as a consequence of potential disturbance from construction and operation of the Proposed Development is considered to be unlikely, intermittent, and reversible for construction and operation. Consequently, no likely significant effects are predicted. Nevertheless, a pre-construction otter survey is recommended as a planning condition to ensure the identification and protection of any resting/lie-up/holt features that might be used in the intervening period between that last otter survey and construction commencing.
- 7.6.12 All the other terrestrial designated sites are >1.5 km away from the Proposed Development. Therefore, no land-take or changes to hydrology would take place within these designated sites, so no direct or indirect habitat loss would occur. No other route to impact on terrestrial designated sites or their features are predicted. Consequently, no likely significant effects on these other designated sites and their ecological features are predicted.
- 7.6.13 The River Oykel SAC is only 1.6 km from the Proposed Development. It is designated for freshwater pearl mussel and Atlantic salmon. However, the River Oykel is in a different water catchment to the Proposed Development and so no changes to hydrology would take place within the River Oykel SAC and there are no pollution or disturbance pathways. Therefore, no likely significant effects are predicted for the River Oykel SAC and its ecological features.

**Table 7.13 Assessment Summary of Impacts of the Proposed Development on the Designated Site(s) Conservation Objectives.**

Designated site	Conservation Objective	Consideration of Potential Impacts (Including Extent, Nature, Function, Population Size and Viability)	Does the Proposed Development Undermine Conservation Objective or Status?	Predicted Impacts
Strath an Loin SSSI	To maintain the condition and extent and distribution of peatland habitats.	<p>For details see habitat specific account (Section 7.6 Effects on Semi-natural Habitats).</p> <p>There will be no change to the extent or distribution of the peatland habitats in Strath an Loin SSSI as there is no land-take from Strath an Loin SSSI. There will be no direct loss to the blanket bog habitat. The condition of the blanket bog will not be adversely impacted by the Proposed Development (e.g. no hydrological pathway as the SSSI is within a different catchment). No pathway for impacting on ecological processes such as colonisation or nutrient cycling has been identified. However, reduced grazing pressure through deer management will be an important component of the OHMP (Technical Appendix 7.6) and will provide ecological benefits and biodiversity gains within the adjacent SSSI, including to peatland habitats.</p>	No	None
	To maintain water levels and water quality of dubh lochans.	<p>There will be no change to the water quality or the water levels in Strath an Loin SSSI and it is in a different water catchment to the Proposed Development. Furthermore, potential hydrological impacts and pollution pathways are considered in Chapter 12 which take account standard mitigation, in particular implementation of a suitable CEMP which will include measures for minimising disruption to groundwater flow and appropriate storage and management of fuels and chemicals. Reduced grazing pressure through deer management will be an important component of the OHMP (Technical Appendix 7.6) and will provide ecological benefits and biodiversity gains within the adjacent SSSI, including to dubh lochans.</p>	No	None
	To maintain breeding bird populations and to avoid significant disturbance of birds during the breeding season.	N/A. Ornithology is considered in Chapter 8.	No	N/A. Ornithology is considered in Chapter 8.

Designated site	Conservation Objective	Consideration of Potential Impacts (Including Extent, Nature, Function, Population Size and Viability)	Does the Proposed Development Undermine Conservation Objective or Status?	Predicted Impacts
	To maintain suitable otter habitat and access routes for otter across the site.	For details see species specific account (Section 7.6 Effects on Otters). There will be no change to the extent or distribution of the otter habitat in Strath an Loin SSSI as there is no land-take from the Strath an Loin SSSI.	No	None
Caithness and Sutherland SAC	To avoid deterioration of the qualifying habitats (see Table 7.6) thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features.	There will be no change to the extent or distribution of the qualifying habitat in the Caithness and Sutherland SAC as there is no land-take within the Caithness and Sutherland SAC. The integrity of the site will not be adversely altered by the Proposed Development (e.g. no hydrological pathway as the SAC is in a different catchment). No pathways for disruption to ecological process (e.g. colonisation, nutrient cycling etc.) has been identified. However, reduced grazing pressure through deer management will be an important component of the OHMP (Technical Appendix 7.6) and will provide ecological benefits and biodiversity gains within the SAC. Peatland restoration in the Grudie Peatlands component of the SAC will provide ecological benefits (Section 7.7.).	No	No adverse impacts. Peatland restoration in the Grudie Peatlands component of the SAC will provide ecological benefits. Further details are provided in Section 7.7.
	To ensure for the qualifying habitats that the following are maintained in the long term: <ul style="list-style-type: none"> <li>○ extent of the habitat on site;</li> <li>○ distribution of the habitat within site;</li> <li>○ structure and function of the habitat;</li> <li>○ processes supporting the habitat;</li> <li>○ distribution of typical species of the habitat;</li> </ul>	There will be no change in the extent of the habitats on the SAC from the Proposed Development. There will be no change in the distribution of the habitats within the SAC from the Proposed Development. The structure and function (e.g. vegetation dynamics such as competition, ecosystem properties such as connectivity or population dynamics) of the habitats in the SAC will not be altered from the Proposed Development. No pathways for disruption of the structure and function of the SAC have been identified. The process supporting the habitats in the SAC will not be altered by the Proposed Development. No pathways for disruption to ecological process (e.g. colonisation, nutrient cycling) has been identified. The distribution of the typical species of the qualifying habitats in the SAC will not be altered from the Proposed Development.	No	None/negligible adverse impacts. Peatland restoration in the Grudie Peatlands component of the SAC will provide ecological benefits. Further details are provided in section 7.7.

Designated site	Conservation Objective	Consideration of Potential Impacts (Including Extent, Nature, Function, Population Size and Viability)	Does the Proposed Development Undermine Conservation Objective or Status?	Predicted Impacts
	<ul style="list-style-type: none"> <li>○ viability of typical species as components of the habitat; and</li> <li>○ no significant disturbance of typical species of the habitat.</li> </ul>	<p>There will be no disturbance to the typical species of the habitat within the SAC.</p> <p>Therefore, the conservation status of the SAC qualifying habitats will be maintained.</p>		
	<p>To avoid deterioration of the habitats of the qualifying species (otter and marsh saxifrage) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features.</p>	<p>For full details see otter specific account (Section 7.6 Effects on Otter).</p> <p>There will be no deterioration of the habitat of the qualifying species in the Caithness and Sutherland SAC as there is no land-take the Caithness and Sutherland SAC and no hydrological or pollution pathways. The integrity of the site will not be altered by the Proposed Development (e.g. no hydrological pathway as in a different catchment).</p>	No	None
	<p>To ensure for the qualifying species that the following are maintained in the long term:</p> <ul style="list-style-type: none"> <li>○ Population of the species as a viable component of the site;</li> <li>○ Distribution of the species within site;</li> <li>○ Distribution and extent of habitats supporting the species;</li> <li>○ Structure, function and supporting processes of habitats supporting the species; and</li> </ul>	<p>For further details see otter specific account (Section 7.6 Effects on Otter).</p> <p>There will be no change in the population or distribution of otter or marsh saxifrage in the SAC.</p> <p>There will be no change in the extent habitat supporting otter or marsh saxifrage in the SAC.</p> <p>There will be no change in the structure, function and process (such as competition and population dynamics, prey abundance) supporting habitat supporting otter or marsh saxifrage in the SAC.</p> <p>There will be no significant disturbance to otter or marsh saxifrage in the SAC. There may potentially be some negligible disturbance from the construction and operation of the Proposed Development on otters. The impact to otters within the SAC as a consequence of potential disturbance from construction and operation of the Proposed Development is considered to be unlikely,</p>	No	None/negligible

Designated site	Conservation Objective	Consideration of Potential Impacts (Including Extent, Nature, Function, Population Size and Viability)	Does the Proposed Development Undermine Conservation Objective or Status?	Predicted Impacts
	<ul style="list-style-type: none"> <li>○ No significant disturbance of the species.</li> </ul>	intermittent and short-term for construction and operation and no likely significant effects are predicted.		

## ***Effects on Badger***

- 7.6.14 This section describes the predicted effects on badgers that could arise, from the construction and operation of the Proposed Development. Embedded mitigation, including avoidance and minimisation to reduce potential effects are described.
- 7.6.15 The construction and operation of the Proposed Development has the potential to adversely affect badgers directly or indirectly in a number of ways:
- physical damage or loss of setts or foraging habitat from construction;
  - damage/destruction of routes potentially used by badgers while crossing the Study Area (severance);
  - disturbance caused by noise of construction or operational of proposed development; and
  - direct injury or mortality.
- 7.6.16 The badger is protected under The Protection of Badgers Act (1992). Under this Act it is illegal to intentionally or recklessly damage a badger sett or obstruct access to a sett and to disturb a badger while occupying a sett, or for any person to kill, injure or take a badger. It is also an offence to cruelly ill-treat a badger, to dig for or to snare a badger. In effect, badgers are fully protected in Scotland, and any planned activity that may affect them requires prior consultation with NatureScot. Badgers are considered to be of local importance within the Study Area and to have low sensitivity to human disturbance.
- 7.6.17 Baseline surveys for badgers were completed on multiple occasions, in different years, across all suitable habitats. A single badger sett was recorded during surveys in 2018. At the sett location there were no other badger signs nearby. However, follow-up visits to the sett in May 2019 showed evidence of use in the form of latrines with scat, bedding and snuffle holes near the sett. Later visits showed no further evidence of sett use. This suggests that while badgers are present within the Main Study Area and use this sett, that it is not in constant use and should therefore probably be considered a satellite sett.
- 7.6.18 Examples of embedded mitigation to avoid and minimise impacts to badgers include:
- Exposed pipe systems will be capped when contractors are off site, and exposed trenches or holes will be covered or exit ramps provided to prevent badgers becoming trapped.
  - Any security lighting will be directed away from the satellite setts.
  - Chemicals will be stored in a safe place.

### **Physical Damage or Loss of Setts or Foraging Habitat from Construction**

- 7.6.19 The single satellite badger sett was deliberately avoided by design and is ca. 225 m away from the nearest part of the Development Footprint. Therefore, no direct loss of a badger sett is predicted from construction. Nevertheless, an ECoW will inspect the area prior to any development to check for badger activity and for any further excavation.
- 7.6.20 Badger activity changes within and between seasons and individuals. The baseline surveys were a snapshot in time (summer season 2018 and 2019). A pre-construction survey will be undertaken prior to construction commencing. If a new badger sett is located, then 30 m work exclusion zones, or 100 m work exclusion zones from any pile driving or blasting work will be created around the badger sett as needed. Where exclusion zones of the required size aren't possible, works will require a licence from NatureScot before they can proceed.

7.6.21 Badger activity was considered to be low and occasional across the Study Area. But they were considered to be occasionally present and could use the habitat in the Study Area for foraging. Badgers are omnivorous, feeding on a wide variety of food from invertebrates, small mammals and birds to plant foods such as fruit, nuts, seeds and crops. The satellite sett was found in a small drier ridge of blanket bog. Blanket bog was widespread within the Study Area, however it is not identified as a key foraging habitat type (NatureScot, no date). No habitats identified as key foraging habitat by NatureScot were located near the satellite sett in the Study Area (e.g. improved pasture, deciduous woodland, cereal fields). Given the widespread nature of blanket bog and the relatively small loss of this habitat type, the magnitude of impact arising from the loss of foraging habitat (land-take) from the Proposed Development on badgers is assessed as **negligible**. The loss of foraging habitat is considered to be unlikely, one-off/never, irreversible and long-term and no likely significant effects are predicted (Table 7.14).

#### Severance

7.6.22 Severance describes the loss of continuity between habitats which ultimately results in the isolation or fragmentation of discrete populations of species and may result in changes to ecological processes such as population dynamics. The Proposed Development does not sever access to any important badger habitats, and it is considered highly unlikely that a 5 m wide road would prevent a badger crossing between different areas (roads do not prevent badgers crossing from one side to the other). To avoid blocking potential routes, and as part of embedded mitigation, any fencing during construction, operation or as part of the OHMP will be permeable and mammal friendly. They will be mammal friendly in-so-far as they will have regular small gaps for badgers to move through. The spacing will be agreed with NatureScot.

7.6.23 The magnitude of potential impact from severance is assessed as **negligible**. With the embedded mitigation, the impact of severance is considered to be unlikely, never/one-off, reversible and short-term and no likely significant effects are predicted (Table 7.14).

#### Disturbance Caused by Noise of Construction and Operation

7.6.24 The construction work would extend over an 18 month period and be concentrated away from the occasionally used satellite sett. Disturbance to important badger locations is therefore unlikely to occur. There is only limited evidence of occasional use of the Study Area by badgers (but which are mobile and have large territories and can appear in unexpected places), the magnitude of impact to badgers as a consequence of potential disturbance from construction and operation of the Proposed Development is assessed as **negligible**. The impact of disturbance on badgers is considered to be unlikely, intermittent, reversible and short-term and no likely significant effects are predicted (Table 7.14).

#### Mortality Caused by Vehicle Traffic during Operation and Construction Activities

7.6.25 Vehicular traffic on the Proposed Development site would increase (from pre-construction baselines of occasional vehicles on the existing track and argocats across the moorland) during construction and operation and so would mean that individual badgers would have a slightly increased possibility (albeit still very small) of being injured or killed by vehicles operating. However, during construction the existing inbuilt design measures (embedded mitigation) means that an ECoW will ensure that pipes etc. are stored correctly (reducing likelihood of badgers from using them and being present in potentially 'high risk' areas) and low vehicle speed limits (15 mph) would greatly reduce the likelihood of injury or death from happening during construction. Similarly, low vehicle speed limits (15 mph) during operation would greatly reduce the likelihood of any operational mortality. It is assumed that most operational visits would be during day light hours, avoiding the twilight periods when badger activity might be expected to increase. Consequently, the magnitude of impact of direct mortality

from construction and operation of the Proposed Development is assessed as **negligible**. With the embedded mitigation, impact of direct mortality from construction and operation of the Proposed Development is considered to be unlikely, intermittent, irreversible and short-term and no likely significant effects are predicted (Table 7.14).

**Table 7.14. Summary of Predicted Impacts on Badger.**

Parameter	Habitat Loss	Severance	Disturbance	Direct Mortality
<b>Beneficial/adverse /neutral</b>	Adverse	Adverse	Adverse	Adverse
<b>Extend</b>	Development Footprint	Across the Development Footprint	Site-Wide	Development Footprint
<b>Duration</b>	Long-Term	Short-Term	Short-Term	Short-Term
<b>Reversibility</b>	Irreversible	Reversible	Reversible	Irreversible (for the Individual) Reversible (for the Population)
<b>Frequency</b>	One-Off/Never	One-Off/Never	Intermittent	Intermittent
<b>Probability</b>	Unlikely	Unlikely	Unlikely	Unlikely
<b>Magnitude</b>	Negligible	Negligible	Negligible	Negligible

### Summary

- 7.6.26 In summary, if the above embedded mitigation measures are implemented no likely significant effects are predicted for badgers in relation to the construction and operation of the Proposed Development. However, badgers can be highly seasonal and irregular in terms of their use of an area. Consequently, although there is no evidence that would suggest the Site is important for badgers, that does not preclude their use of the Study Area and therefore, being legally protected, pre-construction surveys will be conducted immediately around the Development Footprint before any construction commences. This pre-construction protected species survey is recommended as a planning condition to ensure the identification and protection of any setts that might be used in the intervening period between that last badger survey and construction commencing.
- 7.6.27 In order to prevent (non-significant) adverse impacts on badger (which is legally protected) it is recommended that a Badger Species Protection Plan is developed and implemented for all stages of the Proposed Development construction. This is recommended as a planning condition.
- 7.6.28 If the Proposed Development was built, the available information indicates that conservation status of badgers would not likely be affected because (as articulated in the Habitats Directive):
- Badgers are likely to maintain themselves on a long-term basis as a viable component of its habitat in the Caithness and Sutherland region.
  - The natural range of badgers in the Caithness and Sutherland region would not be reduced by the Proposed Development, nor would it become likely to be reduced in the foreseeable future.
  - There would be (and would continue to be) a sufficiently large habitat area in the Caithness and Sutherland to maintain the population badgers on a long-term basis should the Proposed Development be built.

## ***Effects on Otter***

- 7.6.29 This section describes the predicted effects on otters that could arise, from the construction and operation of the Proposed Development. Embedded mitigation, including avoidance and minimisation to reduce potential effects are described.
- 7.6.30 The construction and operation of the Proposed Development has the potential to adversely affect otter directly or indirectly in a number of ways:
- physical damage or loss of holts, feeding and resting sites from construction;
  - damage/destruction to routes used by otters while crossing the Study Area (severance);
  - damage to watercourses by runoff, pollution and blocking of streams;
  - disturbance caused by noise of construction or operational of proposed development; and
  - direct injury or mortality.
- 7.6.31 Otters are legally protected species. The population of otters using the Study Area is considered of international importance. Otters are considered to have moderate-high sensitivity to human activities, with resting places and holts considered particularly highly sensitive.
- 7.6.32 Baseline otter surveys were completed in all suitable habitat within the Study Area on multiple occasions and in different years. Otter spraints were recorded infrequently, but widely across the Main Study Area on Allt na Creiche and Allt na Crionaiche Bige, and an otter couch also recorded on Allt na Crionaiche Bige (Figure 7.11). No other evidence of otter, such as holts or prey remains were recorded. Although there was some evidence of otter use, the low amount of evidence recorded suggests that the Study Area was not particularly important for them.
- 7.6.33 Examples of embedded mitigation to avoid and minimise impacts to otters include:
- Avoidance and minimising crossing watercourses and riparian habitat.
  - Exposed pipe systems will be capped when contractors are off site, and exposed trenches or holes will be covered or exit ramps provided to prevent otters becoming trapped.
  - Mammal friendly designs will be used for large culverts and bridges to provide safe access and crossing points.
  - Chemicals will be stored safely.

### Physical Damage or Loss of Holts, Feeding and Resting Sites from Construction

- 7.6.34 There was only limited, but widespread, sign of otters recorded within riparian habitat in the Study Area during baseline surveys. The otter survey recorded one active couch on Allt na Crionaiche Bige (>1 km away from the Development Footprint). The otter survey failed to find any other resting sites, natal holts or important foraging areas area within the Site. Consequently, the magnitude of impact arising from the loss of holt, feeding and resting sites (land-take) from the Proposed Development on otters is assessed as **negligible**. The loss of holt, feeding and resting sites from the Proposed Development is considered to be unlikely, never/one-off, irreversible and long-term and no likely significant effects are predicted (Table 7.15).

### Severance

- 7.6.35 Severance describes the loss of continuity between habitats which ultimately results in the isolation or fragmentation of discrete populations of species and may result in changes to ecological processes such as population dynamics. The Proposed Development includes approximately 48 new watercourse crossing (for details see Chapter 12). The watercourse crossings have the potential to

disrupt otter movements, when they occasionally use the watercourses. In essence, the watercourse crossings or culvert could theoretically act as a barrier to movement between habitats. As part of the design process, mammal friendly designs (with appropriate mammal ledges to provide routes for mammals to pass through) have been used in the design of large culverts/crossing points, e.g. at Abhainn a' Choire crossing. It is also possible that otters may want to occasionally cross the Site at different locations during construction and operation. To avoid blocking potential routes, and as part of embedded mitigation, any fencing used during construction, operation or as part of the OHMP will be permeable and mammal friendly. They will be mammal friendly in-so-far as they will have regular small gaps for otter to move through. The spacing will be agreed with NatureScot and will form part of the otter licencing/planning conditions.

- 7.6.36 The magnitude of potential impact from severance is assessed as **negligible**. With the embedded mitigation, the impact of severance is considered to be unlikely, never/occasional, reversible and short-term and no likely significant effects are predicted (Table 7.15).

#### Damage to Watercourses by Runoff, Pollution and Blocking of Streams

- 7.6.37 In the unlikely event that a serious pollution incident occurred within the Study Area, such episodes can lead to a sudden pulse of pollutant, which, if not readily contained, might enter the aquatic environment and could affect otters directly, e.g. by coating fur with oil or indirectly through damage to their prey species. However, taking into account the intended implementation of best practice pollution prevention measures (refer to Chapter 12), it is considered highly unlikely that a serious pollution incident would occur during construction and operation. Furthermore, the low levels of otter activity recorded suggests that otters only occasionally use the watercourses within the Study Area for feeding – regular fresh spraints throughout the year would be expected if the Study Area was important for foraging or commuting and these were not found. Therefore, in the unlikely event that a pollution incident did occur, it is very doubtful that pollution would substantially affect otter foraging as numerous other unaffected watercourses would be available. The magnitude of potential impact caused by a pollution event for otter is assessed as **negligible**. With the embedded mitigation, the impact caused by a pollution event is considered to be unlikely, intermittent, reversible and short-term (event), with a medium-term recovery and no likely significant effects are predicted (Table 7.15).

#### Disturbance Caused by Noise of Construction or Operation

- 7.6.38 Since the construction work would be spread over an 18 month period and would be concentrated in areas not heavily/regularly used by otters (which are mobile and have large territories), the magnitude of impact to otters as a consequence of disturbance from construction and operation of the Proposed Development is assessed as **negligible**. The impact caused by noise disturbance is considered to be unlikely, intermittent, reversible and short-term and no likely significant effects are predicted (Table 7.15).

#### Direct Injury or Mortality

- 7.6.39 Vehicular traffic on existing and new tracks would increase (from pre-construction baselines) during the construction and would mean that individual otters would have a slightly increased possibility (albeit still small) of being injured or killed by vehicles on tracks across the Study Area. However, the existing in-built design measures of mammal friendly crossings, that an ECoW would ensure that pipes, holes etc. are stored/covered correctly (preventing otters from using them), and low vehicle speed limits (15 mph) would greatly reduce the likelihood of this happening. Otter crossing road signs will be located at the entrance to the Site and at the watercourse crossings to further help prevent vehicle traffic mortality during operation. Consequently, the magnitude of impact of direct otter mortality from construction and operation of the Proposed Development is assessed as **negligible**. With the embedded mitigation, impact of direct mortality from construction and operation of the

Proposed Development is considered to be unlikely, intermittent, irreversible and short-term and no likely significant effects are predicted (Table 7.15).

**Table 7.15. Summary of Predicted Impacts on Otter.**

Parameter	Habitat Loss	Severance	Pollution	Disturbance	Direct Mortality
<b>Beneficial/adverse /neutral</b>	Adverse	Adverse	Adverse	Adverse	Adverse
<b>Extend</b>	Development Footprint	Across the Development Footprint	Watercourses	Site-wide	Development Footprint
<b>Duration</b>	Long-term	Short-term	Short-term (event) medium-term (recovery)	Short-term	Short-term
<b>Reversibility</b>	Irreversible	Reversible	Reversible	Reversible	Irreversible (for the individual) reversible (for the population)
<b>Frequency</b>	Never/one-off	Never/occasional	Intermittent	Intermittent	Intermittent
<b>Probability</b>	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
<b>Magnitude</b>	Negligible	Negligible	Negligible	Negligible	Negligible

### Summary

- 7.6.40 In summary, if the above embedded mitigation measures are implemented no likely significant effects are predicted for otters in relation to the construction and operation of the Proposed Development. Otters can be highly seasonal in terms of their use of an area, for example utilising otherwise unused burns when hunting for frogs and toads or traversing between catchments. Consequently, although there is no evidence that would suggest the Study Area is very important for otters, they do use the Study Area and therefore, being legally protected, pre-construction surveys will be conducted immediately around the Development Footprint before any construction commences. This pre-construction protected species survey is recommended as a planning condition.
- 7.6.41 In order to prevent (non-significant) adverse impacts on otter (which is legally protected) it is recommended that an Otter Species Protection Plan is developed and implemented for all stages of the Proposed Development construction. This is recommended as a planning condition.
- 7.6.42 If the Proposed Development was built, the available information indicates that conservation status of otters would not likely be affected because (as articulated in the Habitats Directive):
- Otters are likely to maintain themselves on a long-term basis as a viable component of its habitat in the Caithness and Sutherland region.
  - The natural range of otters in the Caithness and Sutherland region would not be reduced by the Proposed Development, nor would it become likely to be reduced in the foreseeable future.

- There would be (and would continue to be) a sufficiently large habitat area in the Caithness and Sutherland to maintain the population otter on a long-term basis should the Proposed Development be built.

### ***Effects on Water Voles***

- 7.6.43 This section describes the predicted effects on water vole that could arise, from the construction and operation of the Proposed Development. Embedded mitigation, including avoidance and minimisation to reduce potential effects are described.
- 7.6.44 The construction and operation of the Proposed Development has the potential to adversely affect water vole directly or indirectly in a number of ways:
- physical damage or loss of water vole habitat from construction;
  - damage/destruction to routes used by water vole while crossing the Study Area (severance);
  - damage to watercourses by runoff, pollution and blocking of streams;
  - disturbance caused by noise of construction or operational of proposed development; and
  - direct injury or mortality.
- 7.6.45 Water vole are legally protected species. The population of water vole using the Study Area is considered of local importance. Water voles are considered to have low sensitive to human disturbance.
- 7.6.46 Baseline water vole surveys were completed in all suitable habitat within the Study Area on multiple occasions and in different years. Water vole burrows were recorded in small numbers and low densities across the Main Study Area (Figure 7.11). There were numerous water vole signs in marshy grassland adjacent to the access track from Abhainn a' Choire eastwards within the Access Track Study Area (Figure 7.12).
- 7.6.47 Examples of embedded mitigation to avoid and minimise impacts to water vole include:
- Avoidance and minimising crossing watercourses and riparian habitat.
  - Exposed pipe systems will be capped when contractors are off site, and exposed trenches or holes will be covered or exit ramps provided to prevent water voles becoming trapped.
  - Mammal friendly designs will be used for culverts and bridges to provide safe access and crossing points.
  - Chemicals will be stored safely.

### **Physical Damage or Loss of Burrows and Feeding Sites from Construction**

- 7.6.48 The water vole surveys recorded several small clusters of burrows, latrines and animal sightings across the Main Study Area, this is in contrast to the water vole surveys undertaken on the Site previously (WKN AG, 2011). This would suggest that while water voles were present within the Main Study Area it was not an area with a large or permanent population. The presence of a small number of water vole signs intermittently within the Main Study Area is quite typical of upland water vole habitat use in Scotland.
- 7.6.49 In contrast to the Main Study Area, water vole signs were numerous in marshy grassland adjacent to the access track from Abhainn a' Choire eastwards. In relation to the Access Track Study Area:
- Water voles were present along most low gradient marshy grassland riparian stream/ditch sides, usually 2-5 m out from channel.

- Almost all water vole signs were downslope of the access track, but often close e.g. 8-10 m from the existing track. One exception was a water vole colony immediately upstream of the existing bridge on Abhainn a' Choire.
- All water vole burrows were on relatively flat or gentle sloping ground in peaty soil.
- Upslope of the east-west access track was generally steep, rocky and unsuitable. No water vole signs were seen, but this does not exclude use of these habitats.
- Many water vole burrows were hidden under rank grass, meaning more signs were almost certainly missed by surveyors. Most burrows were assumed active, but this might not be the case. Very few other activity signs were found. The exception being one latrine, which was on a natural flat area of bare peat in the stream, and it looked an ideal location for a latrine. Similar bare patches of instream peat were not common, so few similar potential latrine locations were recorded.
- Some water vole populations were very close to the access track and Abhainn a' Choire bridge and so great care (marking out individual burrows etc.) will be needed if and when working in and around these areas.
- Given thick and rank vegetation in June, signs were difficult to see, so easily missed. Consequently, water vole activity has likely been under-recorded.

7.6.50 In upland areas, water voles typically exist in networks of small colonies (often forming a so called 'meta-population'), made up of one or a few family groups and around 15-20 % of these colonies suffer extinction each year (Aars *et al.*, 2001; Telfer *et al.*, 2001). Pre-construction surveys will be conducted around proposed work areas in potentially suitable habitats before any construction work commences so that potential annual use, which varies, can be considered. An ECoW will also inspect the riparian habitat prior to any construction work commences.

7.6.51 Where water vole activity is located, 10 m work exclusion zones will be marked. If a 10 m exclusion zone is not possible around active water vole burrows a licence will be required from NatureScot before works can proceed. If necessary trapping and translocation of water voles to another suitable area, as close to the affected area as possible, may be necessary following NatureScot guidelines and under a licence. Regardless, if the existing access track needs widening, then almost all known water vole burrows/colonies would be avoided if this widening was carried out upslope of the existing track. Part of the NatureScot licensing process is to demonstrate that all other reasonable options to avoid impacts on active water vole burrows have been considered. If and where widening is proposed, there would be an expectation that it takes place upslope of the existing track if water voles are present nearby downslope. A detailed road widening plan in relation to water vole burrows/colonies (informed by updated and targeted water vole surveys of potentially affected areas) is recommended as planning condition and would form the basis of any licensing application to NatureScot.

7.6.52 The magnitude of impact arising from the loss of water vole habitat from the Proposed Development on water voles is assessed as **minor**. With the embedded mitigation the loss of water vole habitat from the Proposed Development is considered to be possible, one-off, irreversible and long-term and no likely significant effects are predicted (Table 7.16).

### Severance

7.6.53 Severance describes the loss of continuity between habitats which ultimately results in the isolation or fragmentation of discrete populations of species and may result in changes to ecological processes such as population dynamics. The Proposed Development includes approximately 48 new watercourse crossing (for details see Chapter 12). The watercourse crossings have the potential to disrupt water vole movements. The survey evidence suggests that relatively low numbers of water

voles were present across the Main Study Area, but many were present adjacent to, and downslope from, the proposed access track route. In healthy populations, new water vole colonies are formed annually owing to their exceptional ability to disperse. Dispersing water voles typically travel more than 2 km along watercourses and overland, with some individuals dispersing many kilometres (Telfer *et al.*, 2001; Lambin *et al.*, 2004). Consequently, watercourse crossing points, e.g. at Abhainn a' Choire crossing, will use mammal friendly designs (with appropriate mammal ledges to provide routes for mammals to pass through) to facilitate routes for water voles (and otters) to pass through.

- 7.6.54 The magnitude of potential impact from severance is assessed as **minor**. With the embedded mitigation, the impact of severance is considered to be unlikely, never/occasional, reversible and short-term and no likely significant effects are predicted (Table 7.16).

#### Damage to Watercourses by Runoff, Pollution and Blocking of Streams

- 7.6.55 In the unlikely event that a serious pollution incident occurred within the Study Area, such episodes can lead to a sudden pulse of pollutant, which, if not readily contained, might enter the aquatic environment and could affect water voles directly, e.g. by coating fur with oil or indirectly through being ingested through contaminated food or by damaging their feeding environment. However, taking into account the intended implementation of best practice pollution prevention measures (refer to Chapter 12), it is considered highly unlikely that a serious pollution incident would occur during construction and operation. Therefore, in the unlikely event that a pollution incident did occur, it is very doubtful that pollution would substantially affect water vole habitat as numerous other unaffected watercourses and riparian habitat would be available. Furthermore, the low levels of water vole activity recorded in most areas suggests that only small number of water voles would be impacted. The magnitude of potential impact caused by a pollution event for water vole is assessed as **negligible**. With the embedded mitigation, the impact caused by a pollution event is considered to be unlikely, intermittent, reversible and short-term (event), with a medium-term recovery and no likely significant effects are predicted (Table 7.16).

#### Disturbance Caused by Noise of Construction or Operation

- 7.6.56 Since the construction work would be spread over an 18 month period and mostly be concentrated in areas not heavily used by water voles, the magnitude of impact to water voles as a consequence of disturbance from construction and operation of the Proposed Development is assessed as **negligible**. The impact caused by a noise disturbance is considered to be unlikely, intermittent, reversible and short-term and no likely significant effects are predicted (Table 7.16).

#### Direct Injury or Mortality

- 7.6.57 Vehicular traffic on existing and new tracks would increase (from pre-construction baselines) during the construction and the construction work itself would mean that individual water vole would have an increased possibility (albeit very small) of being injured in the Study Area. However, the existing in-built design measures of mammal friendly crossings and low vehicle speed limits (15 mph) and 10 m work exclusion zones would greatly reduce the likelihood of this happening. Consequently, the magnitude of impact of direct mortality from construction and operation of the Proposed Development is assessed as **negligible**. With the embedded mitigation, impact of direct mortality from construction and operation of the Proposed Development is considered to be unlikely, intermittent, irreversible and short-term and no likely significant effects are predicted (Table 7.16).

#### **Table 7.16. Summary of Predicted Impacts on Water Vole.**

Parameter	Habitat Loss	Severance	Pollution	Disturbance	Direct Mortality
<b>Beneficial/adverse /neutral</b>	Adverse	Adverse	Adverse	Adverse	Adverse
<b>Extend</b>	Along riparian edges	At watercourse crossings	Watercourses	Site-wide	Development Footprint
<b>Duration</b>	Long-term	Short-term	Short-term (event) medium-term (recovery)	Short-term	Short-term
<b>Reversibility</b>	Irreversible	Reversible	Reversible	Reversible	Irreversible (for the individual) reversible (for the population)
<b>Frequency</b>	One-off	Never/occasional	Intermittent	Intermittent	Intermittent
<b>Probability</b>	Possible	Unlikely	Unlikely	Unlikely	Unlikely
<b>Magnitude</b>	Minor	Minor	Negligible	Negligible	Negligible

### Summary

- 7.6.58 In summary, if the above embedded mitigation measures are implemented no likely significant effects are predicted for water voles in relation to the construction and operation of the Proposed Development. Water vole can be highly seasonal in terms of their use of an area, and, being legally protected, pre-construction surveys will be conducted immediately around the Development Footprint before any construction commences. The sensitive occupied areas adjacent to the proposed track widening will be the focus of particular attention as outlined (in paragraph 7.6.51). This pre-construction protected species survey is recommended as a planning condition and would also be required as part of any NatureScot licensing.
- 7.6.59 In order to prevent (non-significant) adverse impacts on water vole (which is legally protected) it is recommended that a Water Vole Species Protection Plan is developed and implemented for all stages of the Proposed Development construction. This is recommended as a planning condition.
- 7.6.60 If the Proposed Development was built, the available information indicates that conservation status of water voles would not likely be affected because (as articulated in the Habitats Directive):
- Water voles are likely to maintain themselves on a long-term basis as a viable component of its habitat in the Caithness and Sutherland region.
  - The natural range of water voles in the Caithness and Sutherland region would not be reduced by the Proposed Development, nor would it become likely to be reduced in the foreseeable future.
  - There would be (and would continue to be) a sufficiently large habitat area in the Caithness and Sutherland to maintain the population water voles on a long-term basis should the Proposed Development be built.

## ***Effects on Bats***

- 7.6.61 This section describes the predicted effects on bats that could arise, from the construction and operation of the Proposed Development. Embedded mitigation, including avoidance and minimisation to reduce potential effects are described.
- 7.6.62 The construction and operation of the Proposed Development has the potential to adversely affect bats directly or indirectly in a number of ways:
- through habitat loss (land-take);
  - loss of roost sites (potentially resulting in mortality);
  - through severance or displacement; and
  - mortality through direct collision or barotrauma (mortality due to damage to bats' lungs caused by sudden change in air pressure close to the turbine blades).
- 7.6.63 Bats are legally protected species. The population of bats using the Study Area is considered of local importance. Bats are considered to have low sensitive to human disturbance.
- 7.6.64 Baseline bat surveys showed low use of the Study Area by small numbers of three common species of bat; common pipistrelle, soprano pipistrelle and Daubenton's bat.
- 7.6.65 Examples of embedded mitigation to avoid and minimise impacts to bats include:
- Avoidance and minimising of impacts on riparian habitat and watercourses, which had a minimum stand-off distance of 50 m
  - New lighting around foraging or commuting corridors, such as watercourses will be avoided or minimised.

### Loss of Habitat

- 7.6.66 The Study Area was assessed as having low bat habitat suitability (Technical Appendix 7.4). The Development Footprint is on open habitat which has limited use by bats. Bats often use linear features for foraging, such as watercourses. There are 48 crossings of riparian habitat. However, bats are able to fly unimpeded over bridges and culverts. Bats also use woodland, especially edges, for foraging. None of the woodland habitat in the Study Area will be impacted by the Proposed Development. Creation of woodland habitat is included as part of the OHMP (Technical Appendix 7.6) which will increase potential bat foraging habitat away from the turbines.
- 7.6.67 The magnitude of impact arising from the loss of bat habitat from the Proposed Development on bats is assessed as **negligible**. The loss of bat habitat from the Proposed Development is considered to be unlikely, one-off, irreversible and long-term and no likely significant effects are predicted (Table 7.17).

### Loss of Roost Sites

- 7.6.68 A tunnel at NC 39115 22766 was assessed as having bat roost potential. The tunnel was within the Study Area, but outside the Site, and ca. 175 m from the existing track. No bats were recorded entering or leaving the tunnel at any point during targeted emergence surveys.
- 7.6.69 The two bridges along the existing access track were assessed as having limited bat roost potential. These were the Abhainn a' Choire Bridge (NC 369 254) and the Loch Shin-Loch Ghriama Bridge (NC 390 252). No evidence of bat occupation was recorded. However, pre-construction bat roost surveys will be undertaken prior to any work on the bridges commencing and legal consideration would need to be given if any were in use.

- 7.6.70 No large trees with bat roost potential (at the time of surveys), would be required to be felled as part of the Proposed Development.
- 7.6.71 No adverse impacts would occur on any known bat roosts. The magnitude of impact arising from the loss of roost sites from the Proposed Development on bats is assessed as **none**. The loss of roost sites from the Proposed Development is considered to be unlikely and no likely significant effects are predicted (Table 7.17).

#### Severance and Displacement

- 7.6.72 Severance is the loss of continuity between habitat features. For bats, severance is considered in relation to the loss of continuity of potentially important linear habitat features used for foraging i.e. the watercourses (or hedgerows in the case of lowland situations). Displacement of bats could occur if, for example, bats avoided using an important foraging area due to the placement of turbines.
- 7.6.73 Overall, the Study Area was assessed as having low bat habitat suitability (Technical Appendix 7.4). There was no evidence for important 'hot spots' of bat activity or that the area was used for bat activities such as swarming or commuting (Technical Appendix 7.4).
- 7.6.74 The Study Area watercourses do not have turbines located on them. Watercourses have a minimum stand-off distance of 50 m and bats are able to fly unimpeded over and around other infrastructure. The habitat in which the turbines are situated was defined as having low suitability for bats. Bat activity was recorded as low or none for most nights during bat activity surveys. Therefore, no likely impacts of severance or displacement from the Proposed Development are predicted.
- 7.6.75 The magnitude of impact from severance or displacement of the Proposed Development on bats is assessed as **negligible**. Impacts of severance and displacement on bats from the Proposed Development is considered to be unlikely, one-off/never, irreversible and long-term and no likely significant effects are predicted (Table 7.17).

#### Mortality from Collision and Barotrauma

- 7.6.76 There is uncertainty regarding the likely impact of wind farms killing bats through direct collision with turbines and through barotrauma. NatureScot guidance (e.g. SNH *et al.*, 2019) recommends consideration of the inherent risk for different bat species, the habitat suitability, the size of the proposal and the bat activity level recorded during surveys and provides an objective assessment of the potential risk of bats to a wind farm site. Further details are provided in Technical Appendix 7.4.
- 7.6.77 Following the 2019 guidance (SNH *et al.*), the overall potential site risk level for the Proposed Development was low. This took into consideration the size of the Proposed Development and low habitat risk. For example: the small number of potential roost sites, which are of low quality; the generally low quality foraging habitat (namely blanket bog and wet heath); that the Site, whilst it has linear watercourse features they are connected to Loch Shin, rather than a wider landscape with a higher quality foraging habitat for bats; the relatively high altitude; and open aspect windy habitat with prolonged periods of low temperatures in winter, spring and autumn. Further details are provided in Technical Appendix 7.4.
- 7.6.78 The assessment of potential risk for each bat species recorded in the Study Area is considered separately.

#### *Common Pipistrelle*

- 7.6.79 Common pipistrelle are considered to be a common species in Scotland, but are generally considered to be inherently susceptible to a high risk of collision with wind turbines (SNH *et al.*, 2019).
- 7.6.80 Bat activity in the Study Area was considered through transect surveys and from static bat detectors. Transect surveys for bats recorded a single common pipistrelle within the Study Area. Static bat

detectors were deployed across the Study Area for a total of 60 nights (covering spring, summer and autumn), with seven static bat detectors recording on each night. A total of 48 passes by common pipistrelle bats were recorded during the survey period. This was considered to be a low number of bat passes.

- 7.6.81 The number of common pipistrelle passes recorded was relatively evenly spread across the Study Area. The highest number of records of common pipistrelles occurred at a static bat detector located in blanket bog near a deer fence which held a small patch of birch woodland. For the whole survey period, this area only recorded a total of 12 passes, all from common pipistrelles. The maximum number in one night, at this location, was only 4 bat passes. The slightly higher number of bat passes at this location could have been due to the proximity of the detector to the linear feature (it was on blanket bog near a deer fence) or the small area of more mature woodland near this area. Neither the deer fence, nor the woodland will be impacted by the Proposed Development.
- 7.6.82 More than half of the records of common pipistrelle passes were during the autumn (28 out of 48 bat passes). Bat activity tends to be higher in the autumn and so this is not considered to be unusual (Collins, 2016). It should be noted that it is not possible to definitively identify individual bats using the bat detectors only the number of bat passes. Bats usually fly back and forth over an area, and so the number of bat passes is unlikely to reflect the number of individual bats.
- 7.6.83 Overall, it was assessed that common pipistrelle had a low overall activity level within the Study Area.
- 7.6.84 An assessment of potential risk of the Proposed Development on common pipistrelle was undertaken following guidance (SNH *et al.*, 2019). Despite common pipistrelle being considered to have an inherently high potential risk of collision/barotrauma with turbines the Proposed Development represents a low overall risk to common pipistrelle bats due to their low activity level across the Study Area and the low overall habitat risk (Further details are provided in Technical Appendix 7.4).
- 7.6.85 The magnitude of impact on common pipistrelle from potential mortality from the Proposed Development is assessed as **negligible**. Impacts of mortality from collision/barotrauma is considered to be unlikely, but occasional throughout the operational life-time of the wind farm (ca. 30 years) and no likely significant effects are predicted (Table 7.17).

#### *Soprano Pipistrelle*

- 7.6.86 Soprano pipistrelle are considered to be a common species in Scotland, but are generally considered to be inherently susceptible to a high risk of collision with wind turbines (SNH *et al.*, 2019).
- 7.6.87 No soprano pipistrelles were recorded during transect surveys. A total of two passes by soprano pipistrelle bats were recorded using static bat detectors during the whole survey period (spring, summer and autumn). This was considered to be a very low number of bat passes. Both passes were detected on the same night on the hill ridge by Cnoc á Bhaid Bhâin. As it is not possible to definitively identify individual bats using the bat detectors and bats fly back and forth, it may have been a single bat.
- 7.6.88 Overall, it was assessed that soprano pipistrelle had a low overall activity level within the Study Area.
- 7.6.89 An assessment of potential risk of the Proposed Development of soprano pipistrelle was undertaken following guidance (SNH *et al.*, 2019). Despite soprano pipistrelle being inherently susceptible to a high potential risk of collision/barotrauma with turbines the Proposed Development represents a low overall risk to soprano pipistrelle bats due to their low activity level across the Study Area and the low overall habitat risk (Further details are provided in Technical Appendix 7.4).
- 7.6.90 The magnitude of impact on common pipistrelle from potential mortality from the Proposed Development is assessed as **negligible**. Impacts of mortality from collision/barotrauma is considered

to be unlikely, but occasional throughout the operational life-time of the wind farm (ca. 30 years) and no likely significant effects are predicted (Table 7.17).

*Daubenton's Bat*

- 7.6.91 Daubenton's bat are considered to be a less common species in Scotland compared to the two pipistrelle species, but are generally considered to have an inherently low susceptibility of collision with wind turbines (SNH *et al.*, 2019).
- 7.6.92 No Daubenton's bats were recorded during transect surveys. A total of ten passes by Daubenton's bat were recorded using static bat detectors during the whole survey period (spring, summer and autumn). These were distributed across the Study Area and across the survey period. A total of five of the ten passes were at the top of a small watercourse, which was not a major linear feature connected to suitable habitat.
- 7.6.93 Overall, it was assessed that Daubenton's bat had a low overall activity level within the Study Area.
- 7.6.94 Daubenton's bats are considered to have a low inherent susceptible of collision/barotrauma with wind turbines. Therefore, the Proposed Development is unlikely to impact upon the small number of Daubenton's bats that use the Study Area.
- 7.6.95 The magnitude of impact on Daubenton's bat from potential mortality from the Proposed Development is assessed as **negligible**. Impacts of mortality from collision/barotrauma is considered to be unlikely, but occasional throughout the operational life-time of the wind farm (ca. 30 years) and no likely significant effects are predicted (Table 7.17).

Summary

- 7.6.96 The recent guidance on bats requires consideration of impacts on bats with regard to the regional population and with regard to Favourable Conservation Status (FCS) definitions. The Study Area is well within the known range for all three species of bat (Mathews *et al.*, 2018), and although the population for Caithness and Sutherland is unknown the Scottish populations estimates are provided in Table 7.9.
- 7.6.97 The potential magnitude of mortality on bats would likely be negligible on the regional population, with no likely significant effects predicted i.e. there would be no detectable regional population level impacts. Therefore, if the Proposed Development was built, the available information indicates that conservation status would not likely be affected because (as articulated in the Habitats Directive):
  - All three species of bats are likely to maintain themselves on a long-term basis as a viable component of its habitat in the Caithness and Sutherland region.
  - The natural range of all three species of bats in the Caithness and Sutherland region would not be reduced by the Proposed Development, nor would it become likely to be reduced in the foreseeable future.
  - There would be (and would continue to be) a sufficiently large habitat area in the Caithness and Sutherland to maintain the population of all three species on a long-term basis should the Proposed Development be built.

**Table 7.17. Summary of Predicted Impacts on Bats.**

Parameter	Habitat Loss	Loss of Roost Sites	Severance and Displacement	Mortality
Beneficial/adverse	Adverse	Adverse	Adverse	Adverse

Parameter	Habitat Loss	Loss of Roost Sites	Severance and Displacement	Mortality
/neutral				
Extend	Development Footprint	None	Watercourses and riparian habitats	Nine turbine locations
Duration	Long-term	Long-term	Long-term	Long-term
Reversibility	Irreversible	Irreversible	Irreversible	Irreversible (for the individual) reversible (for the population)
Frequency	One-off	Never	One-off/never	Occasional
Probability	Unlikely	Unlikely	Unlikely	Unlikely
Magnitude	Negligible	Negligible	Negligible	Negligible

7.6.98 In summary, if the above embedded mitigation measures are implemented no likely significant effects are predicted for bats in relation to the construction and operation of the Proposed Development. However, bats can vary in their use of roost sites. Consequently, although there is no evidence that would suggest the Abhainn a' Choire Bridge and the Loch Shin-Loch Ghriama Bridge are used by bats, it is conceivable that they may be used in the future. Therefore, being legally protected, pre-construction surveys will be conducted at these bridges before any construction commences. Additionally, if any large trees are identified for felling (none are planned to be felled), then bat roost potential surveys would also be required. This pre-construction protected species survey is recommended as a planning condition.

### ***Effects on Reptiles***

7.6.99 This section describes the predicted effects on reptiles, specifically adders, slow worms and common lizards that could arise, from the construction and operation of the Proposed Development. Embedded mitigation, including avoidance and minimisation to reduce potential effects are described.

7.6.100 The construction and operation of the Proposed Development has the potential to adversely affect otter directly or indirectly in a number of ways:

- loss of habitat; and
- direct injury or mortality.

7.6.101 Reptiles are legally protected. The population of reptiles using the Study Area is considered of local importance. Adders are considered to have high sensitivity to human activities, whereas slow worms and common lizards are considered to have moderate sensitivity to human disturbance.

7.6.102 Baseline reptile surveys identified that common lizard were widely distributed in the Study Area, but at low densities. This was not surprising as common lizards are common/abundant in suitable heath habitats across Highland; which themselves are widespread. Adders were recorded twice during walkover surveys in the north of the Study Area. A single slow worm was also recorded within the Study Area. The locations of the adder and slow worm were well outside the Development Footprint (ca. >1 km) (Figure 7.14). There were no obviously important hibernacula discovered during walkover

surveys. Based on these findings, the Study Area is not considered of particular importance for reptiles.

#### Loss of Habitat

7.6.103 Common Lizard are the most abundant reptile in the UK. They are found in a variety of different habitats, including heathland, moorland, grassland and stone walls (McInnery and Minting, 2016) and feed largely on insects and spiders. The adder is widespread across the whole of mainland Britain. Adders can be found in open habitats such as heathland, moorland and open woodland. The slow worm is widespread across the whole of mainland Britain. Slow worms tend to hide under warm objects or in compost heaps or dead wood.

7.6.104 A small amount of open habitat will be lost as a result of the Proposed Development. However, the open moorland is ubiquitous across the Highlands and around the Proposed Development. Habitat loss from the Proposed Development on reptiles is therefore assessed as **negligible**. The loss of habitat from the Proposed Development on reptiles is considered to be likely, one-off, irreversible and long-term and no likely significant effects are predicted (Table 7.18).

#### Injury or Mortality

7.6.105 The construction work would mean that individual reptiles would have an increased possibility of being injured or killed across the Site. To minimise impacts, as part of the embedded mitigation, work will be supervised by the ECoW. Where appropriate the ECoW will;

- Use fencing to prevent reptiles moving into areas where they could be killed or injured.
- Alter habitat to displace reptiles from areas where they could be killed or injured (e.g. careful strimming of grassland to a short sward, provided there is a suitable safe area nearby that they can easily move to).
- Prior to construction commencing, catch reptiles and translocate to suitable habitat that won't be affected by the development. Translocations should be to sites nearby; small numbers of individuals may be added to habitat with existing populations of a species, but if large numbers of individuals are involved they should be released into new, or improved habitat where they won't be competing with an existing population (NatureScot, no date b).

7.6.106 Therefore, with embedded mitigation, magnitude of the impact of reptile mortality is **negligible**. With the embedded mitigation, the impact to reptiles as a consequence of mortality from the construction of the Proposed Development is considered to be possible, one-off, irreversible and long-term and no likely significant effects are predicted (Table 7.18).

**Table 7.18. Summary of Predicted Impacts on Reptiles.**

Parameter	Habitat Loss	Injury or Mortality
<b>Beneficial/adverse/neutral</b>	Adverse	Adverse
<b>Extend</b>	Development Footprint	None
<b>Duration</b>	Long-term	Long-term
<b>Reversibility</b>	Irreversible	Irreversible (for the individual) reversible (for the population)
<b>Frequency</b>	One-off	One-off

Parameter	Habitat Loss	Injury or Mortality
Probability	Likely	Possible
Magnitude	Negligible	Negligible

### Summary

- 7.6.107 In summary, if the above embedded mitigation measures are implemented no likely significant effects are predicted for reptiles in relation to the construction and operation of the Proposed Development.
- 7.6.108 In order to prevent (non-significant) adverse impacts on reptiles (which are legally protected species), it is recommended that a Reptile Species Protection Plan is developed and implemented for all stages of the Proposed Development construction. This is recommended as a planning condition.
- 7.6.109 If the Proposed Development was built, the available information indicates that the conservation status of all three reptile species would not likely be affected because (as articulated in the Habitats Directive):
- Reptiles are likely to maintain themselves on a long-term basis as a viable component of their habitat in the Caithness and Sutherland region.
  - The natural range of reptiles in the Caithness and Sutherland region would not be reduced by the Proposed Development, nor would it become likely to be reduced in the foreseeable future.
  - There would be (and would continue to be) a sufficiently large habitat area in the Caithness and Sutherland to maintain the population of reptiles on a long-term basis should the Proposed Development be built.

### ***Effects on Plants***

- 7.6.110 This section describes the predicted effects on dwarf birch, alpine bearberry and whortle-leaved willow that could arise from the construction and operation of the Proposed Development. The construction and operation of the Proposed Development has the potential to adversely affect these three plant species directly through destruction and habitat loss. These three plant species have no legal protection.
- 7.6.111 Baseline surveys identified a low number of these three plants species within the Study Area, with some records near the Development Footprint (Figure 7.10). It should be noted that the habitat surveys undertaken across the Study Area are not floristic surveys and are not intended to count all individuals of any species. Species were recorded when they were encountered, but additional individuals, maybe present within the Study Area. However, the large parts of the Development Footprint was walked by a botanist in October 2020 (Technical Appendix 7.6) and no additional dwarf birch, alpine bearberry or whortle-leaved willow were located.
- 7.6.112 Examples of embedded mitigation to avoid and minimise impacts to plants include:
- Deliberate avoidance by design of the known dwarf birch population.
  - Deliberate avoidance by design of the known alpine bearberry plants.
  - Deliberate avoidance by design of the majority of the whortle-leaved willow.

### Loss of Dwarf Birch

- 7.6.113 Dwarf birch is an LBAP species. The population in the Study Area is evaluated as locally-regionally important. Dwarf birch is considered to have high sensitivity to human activities/disturbance.

- 7.6.114 Dwarf birch was only found in some localised patches of M19c in the centre of the Main Study Area. These known dwarf birch has been deliberately avoided by design. Great care was taken to avoid, not just the species but the blanket bog habitat in which it was located. The patch of M19c/M17b which holds much of the Main Study Areas dwarf birch population had turbines deliberately moved downslope to avoid this area (specifically Turbines 5, 6 and 7). Although, some track does cross the M19c/M17b near these turbines, and some hard standing is located on it. The vegetation assessment of the turbine locations included a targeted search around these proposed turbines and track for dwarf birch and appropriate habitat. The blanket bog vegetation transitioned in and out of M19 and M17. No dwarf birch were located (Technical Appendix 7.7). The closest known location of dwarf birch to the proposed Development Footprint was ca. 225 m directly south.
- 7.6.115 As part of embedded mitigation, the ECoW will keep a watching brief for dwarf birch throughout the construction phase. If individuals of these species are located within the Development Footprint then, where work can be micro-sited around them, they will be avoided. Any dwarf birch that cannot be avoided will be transplanted to a nearby suitable location. The individuals or clumps, along with the surrounding turf, will be carefully lifted and placed into a pre-prepared similar, nearby location, and watered well to allow re-establishment. The magnitude of potential impact caused by a destruction and habitat loss for dwarf birch is assessed as **negligible**. With the embedded mitigation, the impact caused by destruction and loss of this species is considered to be unlikely, never/one-off, reversible and short-term and no likely significant effects are predicted.

#### Loss of Alpine Bearberry

- 7.6.116 Alpine bearberry is an LBAP species. The population in the Study Area is evaluated as locally important. Alpine bearberry is considered to have moderate sensitivity to human activities/disturbance.
- 7.6.117 Alpine bearberry was found very occasionally in wet heath and blanket bog habitats. Known alpine bearberry have been deliberately avoided by design. The nearest record of alpine bearberry was ca. 80 m from the laydown area at Turbine 8. As part of embedded mitigation, the ECoW will keep a watching brief for alpine bearberry throughout the construction phase. If individuals are located within the Development Footprint then, where work can be micro-sited around them, they will be avoided. Any alpine bearberry that cannot be avoided will be transplanted to a nearby suitable location. The individuals or clumps, along with the surrounding turf, will be carefully lifted and placed into a pre-prepared similar, nearby location, and watered well to allow re-establishment. The magnitude of potential impact caused by a destruction and loss for alpine bearberry is assessed as **negligible**. With the embedded mitigation, the impact caused by destruction and habitat loss is considered to be unlikely, never/one-off, reversible and short-term and no likely significant effects are predicted.

#### Loss of Whortle-leaved Willow

- 7.6.118 Whortle-leaved willow is on the SBL and an LBAP species. The population in the Study Area is evaluated as locally-regionally important. Whortle-leaved willow is considered to have low sensitivity to human activities/disturbance.
- 7.6.119 Several whortle-leaved willow were located across the Study Area. Three of these locations may be impacted by the Proposed Development. Two whortle-leaved willow were located at NC 38698 23536 and NC 38633 23665 beside the access track and a third individual was located at NC 38911 22294 beside the ditch of the current access track. Without mitigation, these individuals may be lost which would result in a small adverse impact on the local-regional population. However, these are only three individuals, which are likely under-recorded in the Study Area and more widely in the region. The data that NBN Atlas holds shows whortle-leaved willow to be well distributed upland Scotland with 138

confirmed and unconfirmed records (NBN Atlas Scotland, 2021). The magnitude of the impact, without mitigation, is considered **negligible-minor**.

- 7.6.120 To minimise impacts, as part of the embedded mitigation, work in this area will be supervised by the ECoW. The ECoW will conduct a pre-construction survey, at a suitable time of year when this species is apparent (e.g. summer). Where work can be micro-sited the whortle-leaved willow will be avoided. Those whortle-leaved willows that cannot be avoided will be transplanted to a nearby suitable location. The individuals, along with the surrounding turf, will be carefully lifted and placed into a pre-prepared similar, nearby location, and watered well to allow re-establishment. It should be noted that both the individuals that may be impacted were growing in the disturbed area around the existing access track, and their presence may have been facilitated, and not impeded, by the current access track. This provides some confidence that properly planned transplantation should work. Therefore, with embedded mitigation, magnitude of the impact is reduced to **negligible**. With the embedded mitigation, the impact to whortle-leaved willow as a consequence of direct loss from the construction of the Proposed Development is considered to be likely, one-off, reversible and short-term. Consequently, no likely significant effects are predicted.

#### Summary

- 7.6.121 If the Proposed Development was built, the available information indicates that conservation status of these three plants would not likely be affected because (as articulated in the Habitats Directive):
- All three species of plant are likely to maintain themselves on a long-term basis as a viable component of their habitat in the Caithness and Sutherland region.
  - The natural range of all three species of plant species in the Caithness and Sutherland region would not be reduced by the Proposed Development, nor would it become likely to be reduced in the foreseeable future.
  - There would be (and would continue to be) a sufficiently large habitat area in the Caithness and Sutherland to maintain the population of all three plant species on a long-term basis should the Proposed Development be built.

#### ***Effects on Semi-natural Habitats***

- 7.6.122 This section describes the predicted effects on semi-natural habitats that could arise, from the construction and operation of the Proposed Development. Embedded mitigation, including avoidance and minimisation to reduce potential effects are described.
- 7.6.123 The construction and operation of the Proposed Development has the potential to adversely affect habitats directly or indirectly in a number of ways:
- direct habitats loss, with a temporary habitat loss at construction and a smaller, but permanent habitat loss during operation;
  - severance or fragmentation;
  - indirect impacts through changes in hydrology; and
  - pollution.
- 7.6.124 Baseline habitat surveys were completed with a number of typical, widespread upland habitats identified including blanket bog, wet modified bog and wet dwarf shrub heath (Figure 7.3). Habitats within the Study Area are not legally protected, although some were listed on the SBL and were equivalent to or approaching Annex 1 habitat definitions. Within the Study Area, the quantity/quality of semi-natural habitats were evaluated as locally important, except for the blanket bog and bog pools

which are evaluated as regionally important due to their proximity to designated sites with blanket bog as a qualifying feature.

7.6.125 Examples of embedded mitigation to avoid and minimise impacts to habitats include:

- Avoidance and minimising impacts on the better quality blanket bog habitat within the Study Area. For example, on the M19, where the dwarf birch was located and the M17b along the flattest part of the ridge towards Cnoc Glas na Crionaiche, where there were bog pools present. This included deliberately moving turbines downslope to avoid this area (specifically Turbines 5, 6 and 7).
- Design iterations were considered in relation to the land-take of blanket bog and altered accordingly. For example, previous iterations had two parallel tracks which would vastly increase the land-take of the blanket bog habitat. The single row of turbines reduces this impact. Further design iteration details are provided in Chapter 3.
- Minimising impacts on blanket bog through the use of floating tracks.
- Avoidance and minimising impacts to habitats associated with watercourses.
- Avoidance of woodland habitats.
- Preserving the topsoil/acrotelm, where possible, from habitat that is lost and laying it over the top of the areas to be reinstated (e.g. cut and fill areas).

#### Direct Habitat Loss

7.6.126 Direct impacts from land-take of habitats have been considered by overlaying the Proposed Development layout supplied by the Applicant on to the Phase 1 Habitat and NVC maps (Figure 7.3).

7.6.127 Parameters that are 'permanent' for the lifetime of the Proposed Development are shown in Table 7.19 and are included as the operational loss. Parameters that are temporary and relate to the construction phase of the Proposed Development are shown in Table 7.19 as construction loss.

7.6.128 The construction loss allows for an assumed 'cut and fill' buffer around all elements of the proposed design layout to account for construction loss, which would be reinstated upon completion (Table 7.19). The 'cut and fill' buffer includes construction elements such as cut and fill, working area and cable laying. The details for the construction loss parameters are provided in Table 7.19, with an explanation of the buffer for each element, as provided by the design team. The construction loss parameters include operational loss parameters (they are not additive).

**Table 7.19. Summary of Predicted Operation and Construction Loss Parameters.**

Infrastructure	Dimensions	Rational for Operational Loss (Provided by SSG Projects)	Operational Loss Area (m <sup>2</sup> ) from GIS	Rational for Construction Loss (Provided by SSG Projects)	Construction Loss Area (m <sup>2</sup> ) from GIS
Existing access track for up-grade	8,871 m x (5 m wide + 3 m of ditch = 70,968 m <sup>2</sup> )	<p>The existing track is currently ca. 3.5 m wide. Therefore, there is ca. 31,048m<sup>2</sup> of existing track that will not be lost or changed.</p> <p>The existing track will be widened to 5 m. There will be ca. 1.5 m of drainage ditch each side, giving an 8 m wide operational track.</p> <p>The existing track has been mapped as part of the Phase 1 and NVC map (included in the 'roads' habitat category. This includes the existing drainage and cut and fill).</p> <p>Much of the 'road' habitat was 8 m or wider. Therefore, this area, mapped as 'road' has been assumed as operational loss along the length of the road marked for upgrade. I.e. the upgraded road itself will be positioned within the existing road and the existing drainage and cut and fill area.</p> <p>As some of the mapped 'road' habitat was not 8 m, and because some of the 'existing access track for upgrade' did not exactly match the mapped 'road' habitat. The two elements (the 8 m wide 'existing access track for up-grade' and the mapped 'road' habitat were merged in GIS for the length of the up-grade section. This ensured any additional semi-natural habitat impacted by the operational track would be included in predicted habitat loss metrics. This is precautionary as much of the upgraded access track will fit into the footprint of the existing access track (including the existing cut and fill).</p>	<p>All of the area mapped as existing 'road' habitat, along the length of the track identified for upgrade (which included the existing drainage ditches and existing cut and fill) plus the 8 m wide existing track for upgrade. These elements were merged. Much of the operational land-take will be the 'road' habitat category. Note this metric is precautionary and includes the ca. 31,048m<sup>2</sup> that is currently track and will not be lost.</p> <p>156,800 m<sup>2</sup></p>	<p>The amount of cut and fill will depend on the underlying topography. Assume that the track will be cut into the hill with the fill material used as a berm on the downslope side. The vast majority of the track is flat and therefore there will be minimal/no cut and fill - only when track starts to climb up the hill that there could be reasonably big cut and fill requirements, up to 10-15 m. Assume average 2 m either side for the existing track.</p> <p>There will also be cable installation as far as the substation - assume a 1.2 m wide trench. Where there is cut and fill this would be accommodated within this area. Assuming 2 m either side for cut and fill so no additional requirement.</p> <p>An assumed 2 m cut and fill either side of the operational loss was taken from the semi-natural habitat. This was completed to ensure a representative impact on semi-natural habitat was included in the calculations. This is considered to be precautionary, as much of the upgrade, including the cut and fill will be incorporated into the currently impacted 'road' habitat with as little additional cutting as possible. But as some areas will have more, and some areas will have less, it is considered a reasonable assumption.</p>	<p>Operational loss, plus 2 m buffer either side = assumed width of 12 m.</p> <p>193,591 m<sup>2</sup></p>

Infrastructure	Dimensions	Rational for Operational Loss (Provided by SSG Projects)	Operational Loss Area (m <sup>2</sup> ) from GIS	Rational for Construction Loss (Provided by SSG Projects)	Construction Loss Area (m <sup>2</sup> ) from GIS
		Much of the land-take for the operational existing access track for up-grade will be to the 'road' habitat category and will include the existing track.			
New access track - excavated	3,915 m x (5 m wide + 3 m of ditch) = 31,320 m <sup>2</sup>	The new excavated sections of track will be 5 m wide and have a ditch either side. Assume 1.5 m either side for ditch giving an 8 m wide operational track.	31,561 m <sup>2</sup>	The amount of cut and fill will depend on the underlying topography. Much of the new track is on a slope. Assume average 3 m either side for the new excavated track.  There will also be cable installation. Assume a 1.2 m wide trench. Where there is cut and fill this would be accommodated within this area. As assuming 3 m either side already - it is not additional.	Operational loss, plus 3 m buffer either side = assumed width of 14 m.  54,381 m <sup>2</sup>
New Access track - floated	3,096 m x (5 m wide + 2 m of taper) = 21,617 m <sup>2</sup>	The sides of the track will taper to ground level to give a width at the base of approximately 7 m.	21,905 m <sup>2</sup>	There would typically be a cable trench alongside up to 1.2 m width. The lack of drainage and cut and fill means a narrow working corridor.	Operational loss plus 1.2 m buffer either side, giving 9.4 m rounded up to 10 m.  31,419 m <sup>2</sup>
Turning heads	2045 m <sup>2</sup> x 2 = 4,090 m <sup>2</sup>	Two turning heads plus 1.5 m of drainage ditch each around the outside.	4,975 m <sup>2</sup>	Assume average 3 m of cut and fill around the turning heads and draining ditch.	6,833 m <sup>2</sup>
Passing places	13 passing places amused  13 x 80 m x 3 m widening = 3120 m <sup>2</sup>	A total of 13 passing places were considered reasonable given that long stretches of the track are straight. Each passing place assumed to be 80 m section of road widened an additional 3 m. A total of 10 were on existing track and 3 were on excavated new track. The widened passing place section were added on to the operational tracks.	3,329 m <sup>2</sup>	No additional loss. The associated buffer included in the appropriate road loss was applied.	None

Infrastructure	Dimensions	Rational for Operational Loss (Provided by SSG Projects)	Operational Loss Area (m <sup>2</sup> ) from GIS	Rational for Construction Loss (Provided by SSG Projects)	Construction Loss Area (m <sup>2</sup> ) from GIS
Turbine foundations	25 m diameter circle (491 m <sup>2</sup> ) x 9 turbine locations = 4,417 m <sup>2</sup>	Assumed 25 m diameter for purpose of calculations. However, approximately half of the foundation is backfilled. There would be ca. 2 m gravel track round the top of the turbine pedestal. Therefore, the total permanently impacted area is likely to be less than this, ca. a 10 m diameter.	4,418 m <sup>2</sup>	There would be a batter on the excavation (ca. 6 m wide) plus working area around the foundation (ca. 2 m wide), which would total a minimum of 8 m from edge of foundation. Therefore, a construction diameter of 41 m diameter.	41 m buffer around turbine location, x 9 turbines. 11,882 m <sup>2</sup>
Hardstanding dimensions	4,575 m <sup>2</sup> x 9 = 41,175 m <sup>2</sup>	1,744 m <sup>2</sup> of each crane pad is as being proposed for reinstatement following turbine erection. However, exactly where this will be is unknown at this stage. Therefore, for the purposes of land-take calculations it is assumed all the hardstanding will be retained for duration of wind farm. This is a known over estimation.	41,175 m <sup>2</sup>	Assume 10 m cut and fill each side of the hardstanding as it must be flat and level. Any cables will be incorporated into this cut and fill area.	Operational loss plus 10 m buffer around. 79,800 m <sup>2</sup>
Substation compound	50 m x 100 m = 5,000 m <sup>2</sup>	There would be a drainage ditch up to 1.5 m wide around perimeter of the substation, but this would be accommodated in the 5,000 m <sup>2</sup> .	5,000 m <sup>2</sup>	The substation is in a fairly flat area. Assume 2 m width of cut and fill.	Operational loss plus 2 m buffer all around. 5,612 m <sup>2</sup>
Construction compound	60 m x 70 m = 4,200 m <sup>2</sup>	The construction compound would be reinstated post-construction. No operational loss.	None	Relatively flat area, so would assume that a topsoil storage area 3 m wide round the perimeter.	Construction compound plus 3 m wide buffer all around. 5,008 m <sup>2</sup>
Borrow pit search area	100 m x 200 m = 20,000 m <sup>2</sup>	The borrow pit would be reinstated post-construction. No operational loss.	None	The borrow pit would be cut into the hillside. There would be a need for the overburden material to be stored round the edge of the excavation - assume a 3 m width buffer.  A temporary access road would be required linking the borrow pit to the new access track.	Borrow pit, plus 3 m buffer around it, plus small section of temporary track. 22,989 m <sup>2</sup>

Infrastructure	Dimensions	Rational for Operational Loss (Provided by SSG Projects)	Operational Loss Area (m <sup>2</sup> ) from GIS	Rational for Construction Loss (Provided by SSG Projects)	Construction Loss Area (m <sup>2</sup> ) from GIS
				This would be ca. 3 m wide. Assumed 14 m buffer, for 42 m of track.	
<i>Total of merged components</i>			257,139 m <sup>2</sup>		387,409 m <sup>2</sup>

- 7.6.129 The total areas of habitat loss calculated in Table 7.19 are not the same as the separate metrics combined due to overlap between components which are then merged in GIS. For example, the 'cut and fill' buffer around components overlap in many places, these overlaps have been merged, so they are not double counted. The totals shown are the merged totals, giving the total land area that will be lost/impacted.
- 7.6.130 The operational and construction layouts were 'clipped' from the Phase 1 Habitat and NVC polygons in GIS. It should also be noted that the habitat boundaries on the Phase 1 Habitat map are indicative only, because there is often a gradation between different habitat types and rarely a distinct boundary.
- 7.6.131 There are clearly several limitations/assumptions associated with the land-take calculations (e.g. assumptions in 'cut and fill' buffers and indicative habitat boundaries). Assumptions made are considered to be representative and caution has been applied in making these assumptions. The land-take calculations should be considered as an estimation of loss, rather than an absolute measure.
- 7.6.132 There may be a small amount of additional loss around the Site entrance of the Study Area, but exactly how much and where has not yet been determined as so this tiny element is not included in the land-take calculations.

*Land-take of the Existing Track*

- 7.6.133 The land-take of the existing track has been presented separately from the other elements of the Proposed Development. This is because the existing track is largely located on, or beside habitat that is already impacted by the existing infrastructure and not on the open hillside where the turbines are located.
- 7.6.134 The estimated habitat loss as a consequence of land-take caused during construction and operation of the upgrade of the existing track is presented in Table 7.20. Note that the operational loss is a subset of construction loss and is not additional.

**Table 7.20 Predicted Direct Habitat Loss from the Upgrade of the Existing Access Track at Operation and Construction. Operational loss is a subset of construction loss.**

Phase 1 Habitat	Operation Loss (ha) (subset of construction loss)	Construction Loss (ha)
Road	12.28	12.31
Wet dwarf shrub heath	1.11	2.62
Road and scrub	0.90	0.90
Blanket bog	0.68	1.41
Marshy grassland (including matrix)	0.46	1.53
Stream side matrix	0.07	0.16
Bracken (including matrix)	0.06	0.11
Flush	0.03	0.10
Building	0.01	0.04
Acid grassland	0.01	0.03

Phase 1 Habitat	Operation Loss (ha) (subset of construction loss)	Construction Loss (ha)
Plantation	0.01	0.02
Blanket bog/wet heath transition	0.00	0.05
<i>Total</i>	<i>15.62</i>	<i>19.26</i>

- 7.6.135 It is clear that the majority of the habitat predicted lost as a result of the upgrade to the existing road would be, as anticipated, the existing road and surrounding cut and fill (which includes the ditch, and acid grassland/dry heath established on the track side) (Table 7.20).
- 7.6.136 Much smaller amounts of other habitats, including blanket bog, wet dwarf shrub heath, marshy grassland and flush are also predicted to be lost. Operational habitat loss is a subset of construction habitat loss and is not additional.
- 7.6.137 Embedded mitigation includes micro-siting (up to 50 m) which would be used to relocate infrastructure to further avoid any sensitive habitats. Micro-siting would necessarily be carried out on the ground under supervision by the ECoW and with agreement of THC. Along the existing access track micro-siting would include firstly keeping as much of the impact on the existing 'road' habitat, including the existing cut and fill. Additionally, habitats such as streams edges and flushes would be avoided, and best practice techniques used for bridges and culverts.
- 7.6.138 It is estimated that there will be ca. 1.41 ha and 2.62 ha of blanket bog and wet dwarf shrub heath lost respectively. It should be noted however, that the land-take calculations were very precautionary so as not to underestimate impacts. However, this likely resulted in an over estimation of predicted land-take losses. The ECoW will provide advice to minimise preventable impacts on these habitats. Embedded mitigation includes, where possible, preserving the topsoil/ acrotelm from the habitat that is lost and laying it over the top of the areas to be reinstated (e.g. over the 'cut and fill'). This will provide a local seed source as well as viable root matter for the areas being reinstated. Therefore, the reinstated vegetation is likely to be similar, if not the same, habitat type as previously present.
- 7.6.139 Some of the road, near the A838 was described as road and scrub due to the close proximity of gorse and willow. The scrub, while not particularly important in itself, can be used by a variety of taxa. Therefore, wherever possible, the scrub should be retained or replanted. A very small amount of plantation habitat is predicted to be lost (likely due to a combination of small limitations such as of the tree canopy being mapped, and assumptions regarding buffer distances). However, no large trees would be required to be felled as part of the Proposed Development. If this situation changes during construction the ECoW will be consulted.

*Land-take of all Other Infrastructure*

- 7.6.140 The estimated habitat loss as a consequence of land-take caused during construction and operation of the wind farm infrastructure (other than the upgrade of the existing track) is presented in Table 7.21.

**Table 7.21 Predicted Direct Habitat Loss from the Development Footprint (not Including the Existing Access Track) at Operation and Construction. Operational loss is a subset of construction loss.**

Phase 1 Habitat	NVC Community	Operation Loss for (ha) (subset of construction loss)	Construction Loss (ha)
Blanket bog/wet heath transition	M17b/M15	4.73	8.03
Blanket bog	M17b	3.05	6.67
Blanket bog	M19c	0.13	0.23
Blanket bog	M19c:M17b	0.97	1.67
Wet modified bog	M25a	1.10	2.30
Stream side matrix	Stream H22:M6c:U5b	0.05	0.09
Wet heath	M15c	0.02	0.36
Bracken	U20a	0.01	0.02
Flush	M6b:M6c:M25a	0.01	0.02
Road	Road	0.01	0.08
Marshy grassland	M25a	-	0.14
<i>Total</i>		<i>10.1</i>	<i>19.6</i>

7.6.141 It is clear that the majority of the habitat predicted lost as a result of the Development Footprint (excluding upgrade to the existing road) would be blanket bog and the blanket bog wet heath transitional habitat (Table 7.21), with much smaller amounts of other habitats, including wet modified bog, wet dwarf shrub heath and flush. Operational habitat loss is a subset of construction habitat loss (Table 7.20) and is not additional.

7.6.142 The blanket bog in the Study Area is currently and historically impacted by management practices and not considered to be in a near natural condition. All of the proposed turbine locations were visited in October 2020 and the vegetation present was reported on and considered in relation to the NatureScot's guidance (2020) which recommends comparing the blanket bog habitat with SSSI selection criteria (JNCC, 1994; Technical Appendix 7.7). The vegetation along the Development Footprint was typically either blanket bog (M17b with patches of M19) or wet heath (M15c). The bog-moss layer was patchy with only occasional, poorly developed hummocks usually of red bog-moss. Bog pools were not a common feature and those found were small and isolated.

7.6.143 Impacts from deer grazing were noted throughout the vegetation, including hoof prints, dung and deer tracks.

- 7.6.144 Micro-erosion features were very common within the bog habitat, with bare peat often seen as small patches through the vegetation. Large erosion features were frequently recorded. These features were often partially vegetated, but many were also dripping with water and had peat stained water trickling down the gullies.
- 7.6.145 Given the lack of surface water-logging features, and the conditions described, overall, it is considered that the blanket bog at the proposed turbine locations was likely to be largely inactive. Although, this does not preclude that limited peat formation may occur at some locations under some circumstances.
- 7.6.146 The blanket bog habitat along the Development Footprint did not meet the SSSI selection criteria and is not considered to be of the highest quality (Technical Appendix 7.7).
- 7.6.147 Embedded mitigation includes micro-siting (50 m) which would be used to relocate infrastructure to further avoid any sensitive habitats, such as bog pools. This would necessarily be carried out on the ground under supervision by the ECoW and with agreement of THC. The habitat surveys provided guidance in many areas of how to avoid the most sensitive, blanket bog areas through design (which has already been done) and micro-siting (yet to be done). Embedded mitigation includes, where possible, preserving the topsoil/acrotelm from the habitat that is lost and laying it over the top of the areas to be reinstated (e.g. over the 'cut and fill'). This will provide a local seed source as well as viable root matter for the areas being reinstated. Therefore, the reinstated vegetation is likely to be similar, if not the same, habitat type as previously present.

*Assessment of Direct Habitat Loss*

- 7.6.148 Table 7.22 provides the habitat loss (at construction, which is largest) as a proportion of the habitats within the Study Area scale, at the regional scale and at the Scottish scale for the key habitats in the Study Area. The Scottish metrics are from those reported by the JNCC (2015), the regional metrics used are those reported in the Caithness and Sutherland SAC Data Form (NatureScot, 2021). There is clearly much more blanket bog in the whole region, i.e. all the blanket bog that is not part of a designated site, but these metrics supply a known, authoritative, regional estimate in which to consider the impacts against.

**Table 7.22. Summary of Predicted Operation and Construction Loss Parameters.**

<b>Phase 1 Habitat</b>	<b>Proportional Study Area Loss and Magnitude</b>	<b>Proportional Regional Loss and Magnitude</b>	<b>Proportional National Loss and Magnitude</b>
Blanket bog	A total of 9.98 ha (8.57 ha + 1.41 ha) of blanket bog, is predicted to be lost from Proposed Development out of the total 710.2 ha (703.5 ha + 6.7 ha) blanket bog Study Area resource = 1.4 %. Magnitude = <b>minor</b> .	A total of 9.98 ha of blanket bog, is predicted to be lost from Proposed Development out of the available regional resource of blanket bog of 113,672 ha = 0.009 %. Magnitude = <b>negligible</b> .	A total of 9.98 ha of blanket bog is predicted to be lost from the Proposed Development out of the total blanket bog Scottish resource of 1,759,000 ha = 0.0006 %. Magnitude = <b>negligible</b> .
Blanket bog/wet heath transition	A total of 8.08 ha (8.03 ha + 0.05 ha) of blanket bog/wet heath transition is predicted to be lost from Proposed Development out of the total 381.4 ha (377.4 ha + 4 ha) blanket bog/wet heath transition Study Area resource = 2.1 %. Magnitude = <b>minor</b> .	A total of 8.08 ha of blanket bog/wet heath transition is predicted to be lost from Proposed Development out of the available regional resource of blanket bog of 113,672 ha = 0.007 %. Magnitude = <b>negligible</b> .	A total of 8.08 ha of blanket bog/wet heath transition predicted to be lost from the Proposed Development out of the total blanket bog Scottish resource of 1,759,000 ha = 0.0005 %. Magnitude = <b>negligible</b> .

Phase 1 Habitat	Proportional Study Area Loss and Magnitude	Proportional Regional Loss and Magnitude	Proportional National Loss and Magnitude
Wet modified bog	A total of 2.30 ha of wet modified bog is predicted to be lost from Proposed Development out of the total 138.6 ha wet modified bog Study Area resource = 1.6 %. Magnitude = <b>minor</b> .	A total of 2.30 ha of wet modified bog is predicted to be lost from Proposed Development out of the available regional resource <sup>2</sup> of blanket bog of 113,672 ha = 0.002 %. Magnitude = <b>negligible</b> .	A total of 2.30 ha of wet modified bog is predicted to be lost from Proposed Development out of the total blanket bog Scottish resource of 1,759,000 ha = 0.0001 %. Magnitude = <b>negligible</b> .
Bog habitats (blanket bog plus blanket bog/wet heath transition plus wet modified bog)	A total of 20.36 ha (9.98 ha + 8.08 ha + 2.30 ha) of bog habitat is predicted to be lost from Proposed Development out of the total 1,230.2 ha habitat Study Area resource = 1.7 %. Magnitude = <b>minor</b> .	A total of 20.36 ha of bog habitat is predicted to be lost from Proposed Development out of the available regional resource of blanket bog of 113,672 ha = 0.017 %. Magnitude = <b>negligible</b> .	A total of 20.36 ha of bog habitat is predicted to be lost from Proposed Development out of the total blanket bog Scottish resource of 1,759,000 ha = 0.0011 %. Magnitude = <b>negligible</b> .
Wet heath	A total of 2.98 ha (0.36 ha + 2.62 ha) of wet dwarf shrub heath is predicted to be lost from Proposed Development out of the total wet heath 166.7 ha (75.6 ha + 91.1 ha) Study Area resource = 1.8 %. Magnitude = <b>minor</b> .	A total of 2.98 ha of wet dwarf shrub heath is predicted to be lost from Proposed Development out of the total wet heath regional resource of 23,042 ha = 0.013 %. Magnitude = <b>negligible</b> .	A total of 2.98 ha of wet dwarf shrub heath is predicted to be lost from Proposed Development out of the total wet heath national resource of 778,000 ha = 0.0003 %. Magnitude = <b>negligible</b> .

- 7.6.149 The land-take assessment shown in Table 7.22 is presented for the construction land-take. The operational land-take is smaller. The construction loss includes a cut and fill buffer around all infrastructure including roads, turbine bases, buildings and borrow pits to take account of additional habitat that may be lost/damaged during constructions. This is precautionary. The buffer around the infrastructure is unlikely to extend far for some/most of the infrastructure, but exactly how much and where is unclear. Buffers would avoid any areas considered more sensitive by an ECoW.
- 7.6.150 The habitat with the largest amount of predicted loss, the bog habitat (including blanket bog, wet modified bog and blanket bog/wet heath transition), was assessed as being of regional importance and the magnitude of impact that would arise as a consequence of construction land-take was assessed as **minor** at the Study Area scale and **negligible** at the regional and national scale (Table 7.22).
- 7.6.151 The previously proposed twenty-two turbine development also predicted bog habitats to have the largest land-take, with a predicted total construction loss of ca. 37.4 ha of blanket bog and wet modified bog. The current design predicts a much smaller land-take loss of blanket bog habitat at construction (20.36 ha).
- 7.6.152 Given the embedded mitigation, including avoiding the better quality blanket bog habitat, the magnitude of change as a consequence of land-take is assessed as **minor**. The impact caused by land-take of bog habitats is considered to be likely, one-off, irreversible and long-term and no likely significant effects are predicted (Table 7.20).
- 7.6.153 However, given the condition of the blanket bog within the Study Area, and the importance of blanket bog and peatland habitats in regard to carbon storage and carbon sequestration and the current

climate emergency, peatland restoration has been included in the OHMP (Technical Appendix 7.6). Peatland restoration will provide benefit to the habitat, the assemblage of species that depend upon it and for the associated ecosystem services benefits e.g. the carbon storage and downstream water quantity and quality. The planned restoration work would involve restoring blanket bog in an area ca. 200 ha within the Study Area which is ca. ten times greater than the predicted habitat loss and a further 270 ha of peatland restoration within the Grudie Peatlands (SSSI and component part of the SAC and Ramsar site).

- 7.6.154 Wet dwarf shrub heath within the Study Area was assessed as being of local importance and the magnitude of impact that would arise as a consequence of construction land-take was assessed as **minor** at the Study Area scale and **negligible** at the regional and national scale (Table 7.22). The magnitude of small losses of other habitat types was considered negligible.
- 7.6.155 The magnitude of change as a consequence of land-take on all other habitat types is assessed as **minor-negligible**. The impact caused by land-take is considered to be likely, one-off, irreversible and long-term and no likely significant effects are predicted.

#### Severance

- 7.6.156 Severance or fragmentation has the potential to adversely affect habitat connectivity for individuals, propagules or gene flow. Access tracks have the potential to separate terrestrial habitats and impede movements of associated species. The average width of all new proposed tracks is 5 m. There is no evidence that any of the important ecological receptors associated with the Study Area habitats would find a 5 m track, and associated cuttings and embankments, a physical barrier, causing severance and preventing propagule movement or gene flow between habitat patches. The Proposed Development is set within a landscape of blanket bog, wet modified bog, wet heath and acid grassland. It is considered highly unlikely, that the Proposed Development would prevent or inhibit the movement of individuals, propagules or gene flow. The magnitude of change as a consequence of severance is assessed as **negligible**. The impact caused by severance is considered to be unlikely, one-off, irreversible and long-term and no likely significant effects are predicted (Table 7.20).

#### Indirect Impacts through Changes in Hydrology

- 7.6.157 Potential indirect impacts on habitats could arise from changes in drainage which can adversely impact on habitats by altering the amount of water a habitat receives or retains. These potential hydrological impacts are considered in Chapter 12 which takes into account standard mitigation, in particular implementation of a suitable CEMP, which will include measures for minimising disruption to groundwater flow, suitable surface water drainage and Sustainable Drainage Systems (SuDS).
- 7.6.158 The proposed access track has associated draining alongside it. Details are provided in Chapter 4 and hydrological impacts are considered in Chapter 12. These shallow track drains are designed following standard guidance and are designed to drain the road surface and not drain the adjacent blanket bog vegetation. Unlike deeper moorland grips or drainage ditches which are designed to lower the water-table of blanket bog, the track drains are shallow (ca. 50 cm) going into the vegetative layer of the blanket bog (acrotelm) and not penetrate into the deeper peat (catotelm).
- 7.6.159 Taking into account the embedded mitigation, the magnitude of change on habitats as a consequence of changes in drainage is assessed as **negligible**. The indirect impact on habitats as a consequence of changes in drainage is considered to be unlikely, one-off, temporary and short-term and no likely significant effects are predicted (Table 7.23).

#### Pollution

- 7.6.160 Potential indirect impacts on the habitats could arise from pollution events. Pollution prevention measures are considered in Chapter 12 which takes into account standard mitigation, in particular

implementation of a suitable CEMP and appropriate storage and management of fuels and chemicals. Therefore, with the embedded mitigation, the magnitude of change on habitats as a consequence of pollution is assessed as **negligible**. With the embedded mitigation, the indirect impact on habitats as a consequence of pollution is considered to be unlikely, intermittent, temporary and short-term (event) to medium term (recovery) and no likely significant effects are predicted (Table 7.23).

### Summary

**Table 7.23. Summary of Predicted Impacts on Habitats.**

<b>Parameter</b>	<b>Habitat Loss</b>	<b>Severance</b>	<b>Change in Hydrology</b>	<b>Pollution</b>
<b>Beneficial/adverse /neutral</b>	Adverse	Adverse	Adverse	Adverse
<b>Extend</b>	Development Footprint	Site wide	Around Development Footprint	Watercourses
<b>Duration</b>	Long-term	Long-term	Short-term	Short-term (event) medium-term (recovery)
<b>Reversibility</b>	Irreversible	Irreversible	Reversible	Reversible
<b>Frequency</b>	Once	One-off	One-off	Intermittent
<b>Probability</b>	Likely	Unlikely	Unlikely	Unlikely
<b>Magnitude</b>	Minor-negligible	Negligible	Negligible	Negligible

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

## **7.7 Mitigation**

7.7.1 In line with best practice guidance (CIEEM, 2018; 2019), an iterative design approach has been taken and the Proposed Development was designed to avoid or minimise ecological receptors, as far as possible within the parameters of the project. As such, mitigation has been embedded within the project design.

### ***Avoidance***

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

- Exposed pipe systems will be capped when contractors are off site, and exposed trenches or holes will be covered or exit ramps provided to prevent protected mammals becoming trapped.
- Any security lighting will be directed away from the sensitive mammal areas.
- Chemicals will be stored in a safe and secure place following best practice.

- Mammal friendly designs (with appropriate mammal ledges to provide routes for mammals to pass through) will be used for large culverts and bridges to provide safe access and crossing points.
- Mammal friendly fencing will be used to avoid blocking potential routes (they will have regular small gaps for mammals to move through).
- Important plant species have been deliberately avoided by the design layout.
- Avoidance has been achieved, wherever possible, of more sensitive habitats. Careful consideration of important habitats was taken into account throughout the design process. More sensitive areas of blanket bog were avoided by design, such as areas with bog pools.
- No large trees with bat roost potential will be felled as part of the design and watercourses have a minimal stand-off distance of 50 m.

### ***Minimisation***

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

- Pre-construction surveys will be undertaken for protected terrestrial mammal. A watching brief will also be kept for these species. Construction workers will be given toolbox talks to provide information with regard to these species.
- Species protection plans will be developed for badgers, otters, water voles and reptiles.
- Work exclusion zones to be identified wherever necessary. For example, 10 m around active water vole habitat. If work is required within the work exclusion zones then a licence will be required from NatureScot before works can proceed.
- There will be full implementation of best practice pollution prevention measures.
- Low vehicle speed limits (15 mph) will be imposed during operation and construction to reduce the likelihood of injury or mortality of protected terrestrial mammals.
- Otter crossing road signs will be located at the entrance to the Site and at the watercourse crossings to further help prevent vehicle traffic mortality during operation.
- Potentially use fencing to prevent reptiles moving into areas where they could be killed or injured.
- Potential reptile habitat will be altered to displace reptiles from areas where they could be killed or injured (e.g. careful strimming of grassland to a short sward, provided there is a suitable safe area nearby that they can easily move to).
- A watching brief will be kept for dwarf birch, alpine bearberry and whortle-leaved willow. If found under the Development Footprint, these species will be avoided wherever possible. Any individuals that cannot be avoided will be transplanted to a nearby suitable location.
- The topsoil/acrotelm will be preserved where possible, from habitat that is lost. It will be laid over the top of the areas to be reinstated (e.g. cut and fill areas) or used in habitat restoration.

### ***Enhancement and Biodiversity Net Gains***

7.7.4 The OHMP (Technical Appendix 7.6) identifies five main objectives, three of which will have direct ecological benefits to the blanket bog habitats within and outwith the Study Area. These include reduced grazing pressure and peatland restoration. Whilst the peatland restoration measures are under the auspices of habitat mitigation, they will nonetheless have wider ecological benefits

increasing the biodiversity and providing additional habitat for a wide range of species including invertebrates such as the azure hawker, large heath and agent and sable as well as reptiles, bats and birds.

7.7.5 A fourth objective in the OHMP is creation of native broadleaf woodland. This objective would have wider ecological benefits increasing the biodiversity and providing additional foraging habitat for species such as bats.

7.7.6 The objectives within the OHMP for peatland restoration are summarised below.

#### Objective 1: Reduce Grazing Pressure at Sallachy

7.7.7 The main land management activity at Sallachy is deer stalking, with red deer (*Cervus elaphus*) being the main quarry species, although roe (*Capreolus capreolus*) and sika (*Cervus nippon*) are also present, as evidenced by images recorded on static cameras (Technical Appendix 7.3). Historic and current impacts of grazing are evident across the peatland habitat at Sallachy. This has been recognised by the land managers and reduced grazing pressure has been achieved. However, the OHMP intends to lower the grazing pressure further and maintain it at a low level for a sustained long-term period to allow natural recovery and regeneration of the peatland habitats. The benefits of reducing the grazing pressure will be widespread across the Estate, including into the adjacent SSSI, not just within the Study Area.

7.7.8 The condition of the blanket bog will be closely monitored throughout and the stocking density adjusted as needed.

#### Objective 2: Peatland Restoration at Sallachy

7.7.9 Peatland restoration is not just good for carbon storage, but also improves water quantity and quality, stops soil erosion, may help reduce the risk of wildfire, and increase the abundance of insects such as crane flies, which are a vitally important source of food for black grouse and waders, such as curlew, snipe, lapwing, golden plover, dunlin and greenshank.

7.7.10 The main aim of the peatland restoration in Sallachy will be to encourage vegetation cover of the peatland and to limit/halt peat erosion and carbon loss. The peatland restoration may also allow areas of the peatland to become actively peat forming and so becoming a sink for carbon.

7.7.11 The baseline surveys showed evidence of widespread erosion with large and small erosion gullies and hagg systems present. The OHMP aims to restore an area of ca. 200 ha using peatland restoration techniques such as hagg reprofiling and mulching.

#### Objective 3: Peatland Restoration at Grudie Peatlands

7.7.12 An area on Sallachy Estate, within the Grudie Peatlands (SSSI and component part of the SAC and Ramsar site), has been identified where the extensive use of moorland gripping in the 1950s-1960s has had historical detrimental effects on habitats, carbon sequestration and downstream hydrology. This area is proposed for restoration habitat management as part of the Sallachy OHMP.

7.7.13 Blocking moorland grips can help to restore natural drainage patterns, encourage re-vegetation (on important habitats of high conservation value), increase carbon sequestration, reduce erosion, and minimise the knock-on effect of hydrological change downstream (e.g. reduce risk of soil erosion and flash flooding).

7.7.14 The OHMP aims to block drains in an area of ca. 270 ha of blanket bog within the Grudie Peatlands SSSI that is within the Sallachy Estate, to restore the natural drainage pattern of this nationally and internationally important peatland, encourage revegetation and improve the biodiversity of the area. This will be undertaken in agreement and in consultation with NatureScot.

## Potential Effects of Enhancement Measures

- 7.7.15 The habitat restoration measures of reduced grazing, ditch block and hagg reprofiling are considered highly suitable and appropriate for Sallachy. The benefits peatland restoration is widely recognised through large scale peatland restoration projects (e.g. Moors for the Future). A reduction in grazing intensity alone is known to have significant beneficial impacts not just on vegetation but on the wider ecosystem. For example, at Glen Finglas reduced sheep grazing intensity resulted in increased insect and spider species richness and increased mammal density. Recent studies have also demonstrated an increase in priority bird species richness and abundance in areas with reduced sheep grazing (Malm *et al.*, 2020).
- 7.7.16 The areas intended for peatland restoration far exceed the area of predicted habitat loss (20.36 ha loss compared to ca. 200 ha peatland restoration within the Study Area plus ca. 270 ha within Grudie Peatlands). Consideration of the benefits to peatland restoration follow CIEEM EclA guidelines and demonstrate that these enhancement measures would likely provide a moderate beneficial impact on the regionally blanket bog resource within the Study Area and beyond, within the nationally and internationally important Grudie Peatlands, which far outweigh the predicted **minor** predicted losses from land-take (Table 7.24).

**Table 7.24. Summary of Predicted Impacts of Peatland Restoration on Peatland Habitats**

Parameter	Habitat Restoration
Beneficial/adverse /neutral	Beneficial
Extend	Estate wide, including parts of Grudie Peatlands (SSSI and component part of SAC and Ramsar)  The extent will be beyond the Site. Reduced grazing will benefit the Study Area, and areas beyond including into the adjacent, nationally and internationally important peatlands in the Strath an Loin (SSSI and component part of the SAC and Ramsar site). Approximately 200 ha of blanket bog will have peatland restoration measures within the Study Area and an additional 270 ha area in Grudie Peatlands (SSSI and component part of the SAC and Ramsar site) has been identified for drainage ditch blocking. This area of blanket bog is considered nationally and internationally important.
Duration	The benefits to peatland habitats from reduced grazing, peatland restoration are likely to be very long-term, beyond the life-time of the Proposed Development.
Reversibility	The benefits from these peatland restoration actions would be reversed if grazing pressure was increase and e.g. drainage ditches were re-dug. In the current climate emergency it seem unlikely that these habitat restoration actions would be reversed.
Frequency	Peatland restoration such as hagg reprofiling and drainage ditch blocking will be a one off event. Reduction in grazing pressure will long-term.
Probability	The benefits from peatland restoration actions are certain. Many large-scale habitat restoration projects have been implemented and the recovery of bogs documented. The effectiveness of best practice restoration techniques are developing rapidly are likely to increase in the future.
Magnitude	The magnitude of change was considered to be moderate (at a local level) and negligible at all other levels considered.

## 7.8 Residual Effects

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

## 7.9 Cumulative Effects

7.9.1 The above sections have considered the effects of the Proposed Development in isolation from other developments. There is no published NatureScot guidance for cumulative impact assessment on most ecological receptors. NatureScot's guidance on cumulative impact assessment of onshore wind farms is confined to landscape and birds. The key principle of NatureScot's cumulative impact assessment guidance for birds is to focus on any significant effects and in particular those that are likely to influence the outcome of the consenting process.

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

7.9.3 Bat guidance (SNH *et al.*, 2019) requires consideration of cumulative impacts with wind farms within 10 km of the Proposed Development. There are no wind farms within 10 km of the Proposed Development. Consequently, no likely significant cumulative effects are predicted for bats.

## 7.10 Summary

7.10.1 This EIA Report chapter has:

- Established the baseline ecological conditions of the Site using a desk-study and targeted ecological surveys (Phase 1 Habitat survey, NVC survey, GWDTE survey, PCA, protected terrestrial mammal survey, bats survey and reptile survey);
- Identified the potentially important ecological receptors likely to be affected by the Proposed Development namely designated sites, badgers, otters, water voles, bats, reptiles, three plant species and semi-natural habitats;
- Assessed the ecological importance and sensitivity of these ecological receptors;
- Evaluated the likely magnitude of predicted impact on these ecological receptors from the construction and operation of the Proposed Development; and
- Identified mitigation, including avoidance and minimisation of impacts on sensitive ecological receptors and has provided enhancement opportunities.

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

**Table 7.25 – Summary Table – Ecology**

Receptor	Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
		Likely Significance?	Beneficial/ Adverse		Likely Significance?	Beneficial/ Adverse
Designated sites	Direct land-take	None	Adverse	None	None	Adverse
	Indirect effects	None	Adverse	E.g. pollution prevention measures.	None	Adverse
Badger	Direct land-take	None	Adverse	E.g. pre-construction surveys and exclusion zones if a new sett is discovered.  A Badger Species Protection Plan will be developed and implemented.	None	Adverse
	Severance	None	Adverse	E.g. any fencing during for construction, operation or as part of the OHMP will be permeable and mammal friendly.	None	Adverse
	Disturbance	None	Adverse	E.g. pre-construction surveys and exclusion zones if a new sett is discovered.	None	Adverse
	Mortality	None	Adverse	E.g. exposed pipe systems will be capped when contractors are off site, and exposed trenches or holes will be covered or exit ramps provided to prevent badgers becoming trapped.  Low vehicle speeds.  A Badger Species Protection Plan will be developed and implemented.	None	Adverse
Otter	Direct land-take	None	Adverse	E.g. pre-construction surveys.  Avoidance and minimising crossing watercourses and riparian habitat.	None	Adverse

Receptor	Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
		Likely Significance?	Beneficial/ Adverse		Likely Significance?	Beneficial/ Adverse
				An Otter Species Protection Plan will be developed and implemented.		
	Severance	None	Adverse	E.g. avoidance and minimising crossing watercourses and riparian habitat.  Mammal friendly designs will be used for culverts and bridges to provide safe access and crossing points.	None	Adverse
	Pollution	None	Adverse	E.g. pollution prevention measures.	None	Adverse
	Disturbance	None	Adverse	None	None	Adverse
	Mortality	None	Adverse	E.g. exposed pipe systems will be capped when contractors are off site, and exposed trenches or holes will be covered or exit ramps provided to prevent otters becoming trapped.  Low vehicle speed.  An Otter Species Protection Plan will be developed and implemented.	None	Adverse
Water vole	Direct land-take	None	Adverse	E.g. pre-construction surveys. Where water vole activity e.g. burrows is located 10 m work exclusion zones will be marked. If a 10 m exclusion zone is not possible around active water vole burrows a licence will be required from NatureScot before works can proceed.  Widening the track on the upslope side near water vole habitat.	None	Adverse

Receptor	Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
		Likely Significance?	Beneficial/ Adverse		Likely Significance?	Beneficial/ Adverse
				A Water Vole Species Protection Plan will be developed and implemented.		
	Severance	None	Adverse	E.g. avoidance and minimising crossing watercourses and riparian habitat.  Mammal friendly designs will be used for culverts and bridges to provide safe access and crossing points.	None	Adverse
	Pollution	None	Adverse	E.g. pollution prevention measures.	None	Adverse
	Disturbance	None	Adverse	None	None	Adverse
	Mortality	None	Adverse	E.g. low vehicle speeds.  A Water Vole Species Protection Plan will be developed and implemented.	None	Adverse
Bats	Direct land-take	None	Adverse	E.g. avoidance and minimising of impacts on riparian habitat and watercourses, which had a minimum stand-off distance of 50 m for turbines.	None	Adverse
	Loss of roosts	None	Adverse	E.g. pre-construction bat roost surveys will be undertaken prior to any work on the bridges commencing and legal consideration would need to be given if any were in use.	None	Adverse
	Severance	None	Adverse	None	None	Adverse
	Mortality	None	Adverse	E.g. avoidance and minimising of impacts on riparian habitat and watercourses,	None	Adverse

Receptor	Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
		Likely Significance?	Beneficial/ Adverse		Likely Significance?	Beneficial/ Adverse
				which had a minimum stand-off distance of 50 m for turbines.		
Reptiles	Direct land-take	None	Adverse	None	None	Adverse
	Mortality	None	Adverse	<p>E.g. consider using fencing to prevent reptiles moving into areas where they could be killed or injured.</p> <p>Alter habitat to dissuade reptiles from areas where they could be killed or injured.</p> <p>Prior to construction commencing, catch reptiles and translocate to nearby suitable habitat that won't be affected by the development.</p> <p>A Reptile Species Protection Plan will be developed and implemented.</p>	None	Adverse
Plants (alpine bearberry, dwarf birch and whortle leaved-willow)	Direct loss	None	Adverse	<p>E.g. deliberate avoidance of known patches/individuals.</p> <p>A watching brief for these species throughout the construction phase.</p> <p>If individuals of these species are located within the Development Footprint then, where work can be micro-sited around them, they will be avoided. Any that cannot be avoided will be transplanted to a nearby suitable location.</p>	None	Adverse
Habitats	Land-take	None	Adverse	E.g. avoidance and minimising impacts on the better quality blanket bog habitat within the Study Area.	None	Adverse/beneficial

Receptor	Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
		Likely Significance?	Beneficial/ Adverse		Likely Significance?	Beneficial/ Adverse
				<p>Avoidance and minimising impacts of habitats associated with watercourses.</p> <p>Avoidance of woodland habitats.</p> <p>Preserving the topsoil/acrotelm, where possible, from habitat that is lost and laying it over the top of the areas to be reinstated (e.g. cut and fill areas).</p> <p>Peatland restoration work as outlined in the OHMP. The planned restoration work would involve restoring blanket bog in an area ca. 200 ha within the Study Area which is ca. ten times greater than the predicted habitat loss and a further 270 ha of peatland restoration within the Grudie Peatlands (SSSI and component part of the SAC and Ramsar site).</p>		
	Severance	None	Adverse	No additional mitigation beyond that of land-take.	None	Adverse
	Changes in hydrology	None	Adverse	E.g. implementation of a suitable CEMP, which will include measures for minimising disruption to groundwater flow, suitable surface water drainage and SuDS.	None	Adverse
	Pollution	None	Adverse	E.g. pollution prevention measures.	None	Adverse

## 7.11 References

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